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CATALOGUE

OF THE

FISHES

IN THE

BRITISH MUSEUM.

BY

ALBERT GÜNTHER, M.A., M.D., Ph.D., F.Z.S.,
ETC. ETC.

VOLUME SECOND.

LONDON:
PRINTED BY ORDER OF THE TRUSTEES.
1860.

CATALOGUE

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ACANTHOPTERYGIAN FISHES

IN THE

COLLECTION

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DR. ALBERT GÜNTHER.

VOLUME SECOND.

SQUAMIPINNES, CIRRHITIDÆ, TRIGLIDÆ, TRACHINIDÆ,
SCIÆNIDÆ, POLYNEMIDÆ, SPHYRÆNIDÆ, TRICHIURIDÆ,
SCOMBRIDÆ, CARANGIDÆ, XIPHIIDÆ.

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PREFACE.

Dr. Günther observes,—"This volume contains the remaining portions of Cuvier's *Percoides* and *Sciænoides,* and nearly the whole of his *Squamipinnes, Cataphracti,* and *Scomberoides.* The instances where Cuvier has described one and the same fish under three or more different names are numerous, especially in the last family; nevertheless the number of apparently well-characterized species has been nearly doubled since his period, as we see from a comparison of the result of this volume with the corresponding parts of the 'Histoire Naturelle des Poissons':—

Total number of species in Cuv. & Val.	769
Total number of species in this volume	1135
Species apparently well characterized in Cuv. & Val.	535
Species apparently well characterized in this volume	959

"The plan adopted in the first volume has been adhered to.

"Several important additions to the Collection have been made since the publication of the first volume, viz.:—

"1. The entire Collection of Fishes of the Museum of the East India Company.

"2. A Collection of Fishes from Vancouver Island, made during the voyage of H.M.S. Plumper.

"3. Several Collections of Fishes from the seas of Lisbon and Madeira, presented by the Rev. R. T. Lowe.

"4. A Collection of Suabian Fishes, received from the Stuttgart Museum.

"5. A Collection of Fishes from Ecuador, purchased of Mr. Fraser.

"6. A Collection of Mexican Freshwater Fishes, purchased of M. Sallé.

"7. A Collection of Marine Fishes, made at Amoy (China).

"8. A Collection of Marine and Freshwater Fishes from the New Hebrides, purchased of Mr. Macgillivray.

"All these Collections contain so many interesting forms, either entirely new to science, or previously not represented in the British Museum, that I cannot forbear directing attention to the great service which may be done to science by collecting fishes, in whatever country or sea an opportunity may occur. If we look at the large accessions to ichthyology during the last fifteen years, we may well conclude that not one-tenth of the existing species are known.

"I would remark, that some authors, who have adopted genera as defined by me, have misunderstood me, if they have thought, that the species, by which a genus is headed, is to be considered as the typical one. A serial arrangement of the species is the most natural, and it ought always to be adhered to as far as possible; therefore I generally commence a genus with that species which has some relation to the preceding genus, placing the more aberrant forms, or those which are allied to the following genus, at the end; and in all such cases the typical species occupy the centre of the series.

"Finally, I return my best thanks to my friend the Rev. R. T. Lowe, for supplying me from his MSS. with detailed accounts of many species examined by him at Madeira."

JOHN EDWARD GRAY.

British Museum.
June 1, 1860.

ADDITIONS

TO THE

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ERRATUM.

Page 61, line 10, *for* p. 213 *read* p. 113.

CATALOGUE

OF

FISHES.

Order I. ACANTHOPTERYGII.

(*CONTINUED.*)

Fam. 8. SQUAMIPINNES.

Squamipinnes, part., *Cuv. Règne Anim.*; *Müller, Berl. Abhandl.* 1844, p. 201; *Owen, Lect. on Comparat. Anat. Vert.* i. p. 49.
Chætodontidæ, part., *Richards. Ichthyol.*

Body compressed and *elevated*, covered with scales, which are sometimes exceedingly finely ciliated, and sometimes smooth. Lateral line continuous, not continued on the caudal fin. Mouth in front of the snout, generally small, with lateral cleft. Eye lateral, of moderate size. Six or seven branchiostegals. Dentition formed by villiform or setiform bands, without canines or incisors; some of the genera with teeth on the palate. *Dorsal fin formed by a spinous and soft portion of nearly equal development; anal with three or four spines, similarly developed as the soft dorsal, and both many-rayed. The vertical fins more or less densely covered with small scales*; the spinous portions sometimes not scaly. The lower rays of the pectorals branched; ventrals thoracic, with one spine and five soft rays. Stomach cæcal; pyloric appendages in moderate number; intestines generally with many convolutions. Air-bladder present, more or less simple. Pseudobranchiæ well developed.

Mostly carnivorous fishes, inhabiting the seas between the Tropics, especially of the Indian region; a few entering rivers or spreading beyond the Tropics.

Synopsis of the Genera.

First group: **Chætodontina.** Palatine or vomerine teeth none.

Præopercular spine none. A single dorsal, without any notch, and with the spinous portion well developed; none of the spines elongate. Muzzle short or of moderate length	1. CHÆTODON.
Muzzle very long; scales moderate, or rather small	2. CHELMO.
One dorsal, with eleven to fourteen spines, the fourth of which is filiform. Scales moderate	3. HENIOCHUS.
Præoperculum with a strong spine; dorsal with twelve to fifteen spines	4. HOLACANTHUS.
Præoperculum with a strong spine; dorsal with eight to ten spines	5. POMACANTHUS.
Anal with four spines; the spinous portion of the dorsal not scaly, and separated from the soft by a notch	6. SCATOPHAGUS.
Anal with three spines; the spinous portion of the dorsal not scaly, separated from the soft by a deep notch, with nine spines, the third of which is elongate. Pectorals short	7. EPHIPPUS
Anal with three spines; the spinous portion of the dorsal not scaly, separated from the soft by a deep notch, with nine spines, the third of which is elongate and flexible. Pectorals long	8. DREPANE.
Anal with three spines; the spinous portion of the dorsal not scaly, separated from the soft by a deep notch, with eight spines, the second of which is the longest; pectorals of moderate extent	9. HYPSINOTUS.

Second group: **Scorpidina.** Teeth on the palate. Dorsal fin occupying the middle of the back. (Australian Seas.)

One dorsal, with nine to ten spines, the posterior of which are the longest	10. SCORPIS.
One dorsal, with eleven spines, the middle of which are the longest	11. ATYPUS.

Third group: **Toxotina.** Teeth on the palate. Dorsal fin occupying the posterior half of the back.

One dorsal, with five spines	12. TOXOTES.

First Group. CHÆTODONTINA.

1. CHÆTODON*.

Chætodon, (*Artedi*) *Cuv. Règne Anim.*; *Cuv. & Val.* vii. p. 3.

Body much compressed and elevated. One dorsal, without any notch, with the spinous and soft portions similarly developed; none of the spines elongate. Muzzle short or of moderate length. No teeth on the palate; præoperculum entire or slightly serrated, without spine. Scales generally large or of moderate size. Six branchiostegals. Air-bladder sometimes with horns or with two divisions. Intestinal tractus with many convolutions; pyloric appendages in moderate number.

Seas between the Tropics.

I have divided the numerous species of this genus as follows, in order to facilitate their determination:—

I. Scales large or of moderate size, not exceeding fifty-five transverse series.
  A. More than ten dorsal spines.
    1. More than three anal spines, p. 4.
    2. Three anal spines.
      a. One or more of the dorsal rays elongate, p. 6.
      b. None of the dorsal rays elongate.
        α. A large round black or white spot—
          aa. On the dorsal fin, p. 8.
          bb. On each side of the body, p. 11.
        β. Without a round black or white spot.
          aa. Body with distinct longitudinal bands (not stripes), p. 13.
          bb. Body with broad cross-bands, p. 17.
          cc. Body without bands, with stripes or spots, or uniform.
            αα. Ventrals dark-coloured, p. 21.
            ββ. Ventrals light-coloured.
              * Caudal with a black cross-band or crescent, p. 23.
              * Caudal with a fine black cross-streak, p. 28.
              * Caudal with a blackish margin, p. 30.
              * Caudal without dark transverse streaks, generally uniform, p. 31.
  B. Ten dorsal spines or less, p. 34.
II. Scales small, in sixty or more transverse series, p. 34.

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* 1. Chætodon mertensii, *Cuv. & Val.* vii. p. 47.—Hab. ——?
2. *Renard*, ii. 56. 239; *Valent.* f. 407.—Chætodon principalis, *Cuv. & Val.* vii. p. 81.—East Indies.
3. Chætodon parallelus, *Gronov. Syst. ed. Gray*, p. 70.—East Indies.
4. Chætodon lunulatus, *Quoy & Gaim. Voy. Freyc. Zool.* p. 381.—Sandwich Islands.
5. Chætodon, no. 7, *Artedi*, *Species*, p. 95.—Hab. ——?
6. Chætodon layardi, *Blyth in Kelaart*, *Prodrom. Faun. Zeylan. Append.* p. 50.—Ceylon.

I. Species with large or moderately large scales, not exceeding fifty-five transverse series.

A. With more than ten dorsal spines.

1. With more than three anal spines.

1. Chætodon strigangulus.

Chætodon strigangulus, (*Solander*) *Gm.* p. 1269; *Cuv. & Val.* vii. p. 42. pl. 172; *Beechey's Voyage, Zoology*, p. 60. pl. 17. f. 2; *Bleek. Banda*, i. p. 239.
—— triangularis, *Rüpp. Atlas, Fische*, p. 42. pl. 9. f. 3.

D. $\frac{14}{15}$. A. $\frac{4}{15}$. L. lat. 26. L. transv. 5/16. Vert. 10/14.

The snout is not produced, and nearly equal in length to the diameter of the eye. The soft dorsal is produced into an acute-angled lobe. The ocular band rather narrower than the eye and white-edged; body with about twenty-five blackish stripes, angularly bent, with the angle pointing forwards. Caudal black, with whitish margin; the dorsal and anal fins with a fine black marginal line; ventrals whitish.

From the Red Sea to Polynesia.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Adult: skeleton. Amboyna. Purchased of Mr. Frank.
c. Adult. From the Collection of the Zoological Society.

The intestinal tract makes a great many convolutions. The air-bladder is divided into a large posterior portion and into a smaller anterior one. The anterior emits two small processes.

Skeleton.—The skeleton of this and the other species of *Chætodon* shows several very remarkable modifications of the structure of some bones of the skull. The maxillary has so irregular a form, that no description can give an adequate idea of it; two portions can be distinguished, a superior and an inferior, separated from each other by the narrower and slightly bent middle of the bone. A very long process, directed forwards, extends from the palatine bone across the centre of the maxillary. The anterior portion of the intermaxillary, in which the teeth are implanted, is much swollen; the posterior process is much longer than the descending branch. The mandibula also is swollen and very solid. The upper portion of the skull appears as one solid, elevated, rounded, smooth bony mass, without any ridges or grooves. The sutures between the principal frontal bones and the supraoccipital alone are visible. The supraoccipital is continued posteriorly in the strong occipital crest, which has the upper margin swollen, and extends on to the first interneural.

The infraorbital ring is moderately developed, and becomes gradually narrower posteriorly. The præoperculum is smooth, with a very rudimentary muciferous channel behind the interior ridge, which is scarcely elevated; the inferior limb is rather shorter than the posterior. The operculum is subquadrangular, not quite twice as high as broad, with the posterior side emarginate. The interoperculum is broader and longer than the suboperculum. The humerus is rather feeble. The cavity formed by the coracoid and the ulna and radius is broad and deep, and offers a strong basis for the muscles of the pectoral fin, which, in these short and elevated fishes, is more strongly developed, in order to maintain the fish in equilibrium, than in those with a more elongate and depressed body. Each pubic bone is formed by three lamellæ of nearly equal development, and there is no free space between them.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·4. The ribs are rather strong and broad. The longest neural and hæmal spines are those of the middle vertebræ. The first two hæmal spines are the strongest, and excavated anteriorly. Each of the anterior neural and interneural spines is dilated posteriorly in a transparent lamella. The first interhæmal is very strong, and apparently composed of two spines.

2. Chætodon plebejus.

L. Gm. p. 1269; *Cuv. & Val.* vii. p. 68.

D. $\frac{14}{17}$. A. $\frac{4}{15}$. L. lat. 45. L. transv. 6/15.

The snout is rather obtuse, and nearly equal in length to the diameter of the eye; præoperculum scarcely denticulated; the dorsal and anal fins rounded posteriorly. The ocular band reaches from the side of the neck to the inferior margin of the interoperculum, is white-edged, and darker above the eye than below. Tail with a large rounded, blackish, white-edged spot near its back, immediately below the end of the dorsal.

South Sea.

a. Adult: rather bleached. Old Collection.

3. Chætodon trifascialis.

Chætodon trifascialis, *Quoy & Gaim. Voy. Uran. Zool.* ii. p. 379. pl. 62. f. 5 (not good); *Bleek. Batoe*, p. 313.
—— bifascialis, *Cuv. & Val.* vii. p. 48.
Megaprotodon bifascialis, *Guichen. Revue Zool.* 1848, p. 12.

D. $\frac{14}{16-17}$. A. $\frac{4}{15-16}$. L. lat. 28–30.

The snout is very slightly produced, somewhat pointed, and shorter than the diameter of the eye; præoperculum distinctly serrated; the dorsal and anal fins with the posterior angle rounded. The ocular band is not wider than the eye, edged with white, and extends from the neck over the chest. Body with oblique blackish streaks, angularly bent, with the angle directed forwards; a broad oblique black band from the soft dorsal to the posterior part of the anal, anteriorly with a broad white margin; the soft dorsal and anal with a yellowish edge posteriorly; caudal with a black band across the middle, the margin being transparent; ventrals white.

Seas of Guam and Batoe.

4. **Chætodon leachii.**

Chætodon leachii, *Cuv. & Val.* vii. p. 49.
Megaprotodon leachii, *Guichen. l. c.*

D. $\frac{14}{16}$. A. $\frac{4}{16}$.

The snout is shorter than the diameter of the eye; the dorsal and anal angular posteriorly; the former reaches as far backwards as the caudal, the fifth ray being the most elongate. Ocular band white-edged. (*Cuv.*)

Hab. ——?

2. With three anal spines.

a. One or more of the dorsal rays elongate.

5. **Chætodon setifer.**

Renard, i. p. 39. f. 198, ii. pl. 31. f. 145; *Valent.* iii. p. 385. f. 116; *Seba*, iii. t. 25. f. 11.
Chætodon setifer, *Bl.* t. 426. f. 1; *Bl. Schn.* p. 225; *Cuv. & Val.* vii. p. 76; *Guérin, Iconogr. Poiss.* pl. 22. f. 1; *Less. Voy. Coq. Zool.* ii. p. 175, *Poiss.* pl. 29. f. 2; *Richards. Ichth. China*, p. 246; *Cuv. Règne Anim. Ill. Poiss.* pl. 38. f. 1; *Jenyns, Zool. Beagle, Fishes*, p. 61.
Pomacentrus filamentosus, *Lacép.* iv. pp. 506, 511.
Chætodon sebanus, *Cuv. & Val.* vii. p. 74.
—— auriga, var., *Rüpp. N. W. Fische*, p. 28.
—— lunaris, *Gronov. Syst. ed. Gray*, p. 70.
—— auriga, *Bleek. Celebes*, iv. p. 164.

D. $\frac{13}{23}$. A. $\frac{3}{20}$. L. lat. 33. L. transv. 6/13.

Snout produced, pointed, conical, one-half longer than the diameter of the eye; præoperculum very indistinctly serrated. The fifth dorsal ray more or less elongate, filiform. The ocular band extends over the interoperculum, is narrower above the orbit and wider below. The anterior part of the back with blackish streaks obliquely descending forwards; the rest of the body with streaks obliquely ascending forwards. Top of the dorsal behind the fifth ray with a round black, white-edged spot. The vertical fins with a very fine blackish marginal line; ventrals whitish.

From the Red Sea through all the Indian Seas to Polynesia.

a. Adult. Isle de France.
b. Adult. Amboyna. Purchased of Mr. Frank.
c. Adult. China. Presented by Captain Sir E. Belcher.
d. Adult. China. Presented by Sir J. Richardson.
e. Adult: not good state.
. Adult. Aneiteum. Presented by the Lords of the Admiralty.

6. Chætodon auriga.

Chætodon auriga, *Forsk.* p. 60; *Bl. Schn.* p. 226; *Cuv. & Val.* vii. p. 79.
Chætodon auriga, part., *Rüpp. N. W. Fische*, p. 28.

D. $\frac{13}{23}$. A. $\frac{3}{19}$. L. lat. 33. L. transv. 6/13.

Snout produced, pointed, conical, one-half longer than the diameter of the eye; præoperculum very indistinctly serrated; the fifth dorsal ray more or less elongate, filiform. The ocular band extends over the interoperculum, is narrower above the orbit and wider below. The anterior part of the back with blackish streaks obliquely descending forwards, the remainder of the body with streaks obliquely ascending forwards; an oblique cuneiform blackish band from the origin of the soft dorsal to the posterior part of the anal. Dorsal edged with black; caudal and anal fins with a very fine blackish marginal line; ventrals whitish.

Red Sea.

a. Adult: stuffed. Red Sea.
b. Adult.

7. Chætodon ephippium.

Chætodon ephippium, *Cuv. & Val.* vii. p. 80. pl. 174; *Less. Voy. Coq. Zool.* ii. p 174, *Poiss.* pl. 29. f. 1; *Bleek. Amboina*, iv. p. 336, and *Floris*, p. 325.
—— garnotii, *Less. l. c.*

D. $\frac{13}{24}$. A. $\frac{3}{22}$. L. lat. 36. L. transv. 6/12.

The snout is conically prominent, one-half longer than the diameter of the eye; præoperculum slightly denticulated; the fifth ray of the dorsal fin elongate, filiform. The ocular band rudimentary; a very large subovate black patch, edged with white, occupies the greater part of the dorsal and the posterior portion of the back; caudal greyish, with the upper and lower margins white.

Molucca Sea; Polynesia.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Adult. Feejee Islands. Voyage of the Herald.

8. Chætodon semeion.

Bleeker, Kokos, iv. p. 450.

D. $\frac{14}{27}$. A. $\frac{3}{24}$. L. lat. 35.

The snout is pointed; the præoperculum scarcely denticulated; the dorsal and anal rounded posteriorly; the anterior three dorsal rays are produced, forming together a band which reaches to the caudal; caudal concave, the external rays being produced. The ocular band is broader than the orbit. Yellow, each scale with a violet centre. Dorsal fin with a broad black longitudinal band; the scaly sheath of the spinous dorsal with a blue and black margin, continued on the soft portion of the fin; one-third of the soft dorsal and anal is scaleless, and longitudinally coloured with yellow, rosy, brown and orange.

The anal with a triangular black band at the base; caudal with bright yellow margins. (*Bl.*)

Sea of Kokos.

b. None of the dorsal rays elongate.

aa. A round black spot on the dorsal fin.

9. **Chætodon striatus.**

Seba, iii. 25. 9; *Klein, Miss.* iv. pl. 10. f. 4, pl. 11. f. 4; *Duhamel, Pêches,* iv. pl. 13. f. 3.
Chætodon striatus, *L. Mus. Ad. Fried.* i. pl. 33. f. 7; *L. Syst. Nat.* i. p. 464; *L. Gm.* i. p. 1249; *Bl.* taf. 205. f. 1; *Bl. Schn.* p. 222; *Cuv. & Val.* vii. p. 10; *Gronov. Syst. ed. Gray,* p. 68; *Cuv. Règne Anim. Ill. Poiss.* pl. 37. f. 1; *Casteln. Anim. nouv. ou rares Amér. Sud, Poiss.* p. 19 (not *Rosenthal*).
Chætodon, sp., *Gronov. Zoophyl.* no. 235.

D. $\frac{12\,(11)}{21}$. A. $\frac{3}{18}$. L. lat. 38–42. L. transv. 8/16. Cæc. pylor. 8. Vert. 10/14.

The snout is slightly produced, and very little longer than the diameter of the eye; the vertical fins rounded posteriorly; the fourth and fifth dorsal spines are the longest, their length being equal to the distance between the extremity of the snout and the præopercular margin. Five blackish-brown cross-bars: the first through, and narrower than, the eye; the second from the second, third and fourth dorsal spines; the third from the posterior five dorsal spines; the fourth superiorly confluent with the third, to the root of the caudal; the fifth across the middle of the caudal, continued on the soft dorsal and anal fins, and yellow-edged at the convex (posterior) margin; ventrals black.

Young specimens with a distinct, round, black, white-edged spot near the upper extremity of the fourth band.

Atlantic coasts of Tropical America.

a. Adult. Puerto Cabello. From Mr. Brandt's Collection.
b. Adult: not good state. Venezuela. From Mr. Dyson's Collection.
c. Fine specimen. St. Domingo. From Mr. Cuming's Collection.
d–p. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
q. Adult. West Indies. From Mr. Scrivener's Collection.
r. Adult: bad state. From the Haslar Collection.
s. Adult. From the Haslar Collection.
t. Adult. From the Collection of the Zoological Society.
u. Adult.
v. Adult. From the Haslar Collection.
w. Adult. From the Collection of the Zoological Society.
x. Adult. Presented by Sir A. Smith.
y. Adult: stuffed.
z. Half-grown. Old Collection.
α, β. Young. Old Collection.

γ. Adult: skeleton. Presented by the Zoological Society.
δ. Half-grown: skin. From Gronov's Collection.

Variety: A. $\frac{3}{16}$. A round darker spot where the fourth band crosses the base of the dorsal.

ε, ζ. Two inches and a half long. From the Collection of the Zoological Society.

The *skeleton* is very much like that of *Ch. strigangulus*; the lower limb of the præoperculum, however, is considerably shorter than the posterior.

10. Chætodon bimaculatus.

Bloch, taf. 219. f. 1; *Bl. Schn.* p. 225; *Cuv. & Val.* vii. p. 67.

D. $\frac{12}{20}$. A. $\frac{3}{16}$. L. lat. 34. L. transv. 6/15.

The snout is produced, longer than the diameter of the eye; præoperculum finely denticulated; the soft dorsal and anal fins angular posteriorly. Body with indistinct oblique streaks; the ocular band is narrower than the eye, and reaches from the neck to the inferior margin of the interoperculum. A large round blackish blotch in the middle of the base of the soft dorsal, another small one of deep black colour at the top of its angle; anal with an indistinct blackish marginal line. The remainder without ornamental colours.

Atlantic coasts of Tropical America.

a–f. Adult: skins. Jamaica. From Dr. Parnell's Collection.
g, h. Adult and half-grown. From the Collection of the Zoological Society.
i. Adult From the Collection of the Zoological Society.
k. Adult: bleached. Old Collection.

11. Chætodon biocellatus.

Chætodon biocellatus, *Cuv. & Val.* vii. p. 62; *Less. Voy. Duperr. Zool. Poiss.* p. 176; *Bleek. Boeroe*, p. 403.
—— ocellatus, *Bleek.* (not *Cuv. & Val.*) *Natuurk. Tydschr. Nederl. Ind.* vi. p. 212.

D. $\frac{12}{23\text{–}25}$. A. $\frac{3}{18\text{–}20}$. L. lat. 30.

The snout is little produced, pointed, and shorter than the diameter of the eye; præoperculum very indistinctly denticulated; dorsal and anal fins rounded posteriorly. The ocular band is somewhat narrower than the orbit, and crosses the neck at some distance before the origin of the dorsal fin; there is a broad white band behind it; a broad triangular brown transverse band from the anterior six dorsal spines to the axil; tail with a broad blackish-brown cross-band, broadly edged with lighter anteriorly and posteriorly; dorsal with a blackish margin, and with a large round black, white-edged spot between the fifth and fourteenth rays; anal brownish, with a broad yellow band; caudal with a blackish-brown cross-band near the base; ventrals minutely dotted with brownish.

Seas of Buru, Timor, and Oualan.

12. Chætodon nesogallicus.

Renard, Poiss. Mol. i. pl. 5. f. 37.
Chætodon nesogallicus, *Cuv. & Val.* vii. p. 63; *Bleek. Banda,* i. p. 240.

D. $\frac{13}{24}$. A. $\frac{3}{22}$. L. lat. 30.

The snout is moderately produced; præoperculum very slightly denticulated; the dorsal and anal fins rounded posteriorly. The black ocular band is about as wide as the eye, and extends over the interoperculum. A broader vertical black band across the tail, the soft dorsal and anal fins; a white ring in the upper extremity of the latter band; anterior part of the back with blackish streaks obliquely descending forwards.

Indian Ocean and Archipelago.

a, b. Half-grown. Amboyna. Purchased of Mr. Frank.
c. Young. Amboyna. Purchased of Mr. Frank.

13. Chætodon ocellatus.

Bloch, iii. p. 105. taf. 211. f. 2; *Bl. Schn.* p. 223; *Cuv. & Val.* vii. p. 75 (not *Bleek. Natuurk. Tydschr. Nederl. Ind.* vi. p. 212).

D. $\frac{12}{22?}$. A. $\frac{3}{19?}$.

The snout is produced, longer than the eye; dorsal and anal fins rounded posteriorly. The ocular band is narrower than the eye, and extends from the nape of the neck to the chest. Body uniform. The soft dorsal with a large round black, white-edged spot near the middle of the base.

East Indies.

14. Chætodon modestus.

Chætodon modestus, *Temm. & Schleg. Faun. Japon. Poiss.* p. 80. pl. 41. f. 2.
—— ocellatus, *Gronov. Syst. ed. Gray,* p. 68.

D. $\frac{11}{23}$. A. $\frac{3}{18}$. L. lat. 46. L. transv. $\frac{13}{28}$.

Body and the spinous dorsal very much elevated; the snout is produced, and longer than the diameter of the eye; præoperculum denticulated. The soft dorsal and anal with the posterior margin nearly vertical. A single brown band along the middle of the forehead; the ocular band is narrower than the orbit, and extends across the chest; body with two broad brownish bands; caudal with a brownish cross-band on the base, ventrals light brownish, in young specimens black. A round black spot between the third and seventh dorsal rays, on the upper half of the fin.

Japanese and Chinese Seas.

a, b. Adult: stuffed. Japan. Purchased of Mr. Frank.
c. Adult: bad state. Japan. Purchased of Mr. Frank.
d. Half-grown: stuffed. China Seas.

e. Young. China Seas. Presented by Captain Sir E. Belcher.
f, g. Adult: stuffed. Purchased.
h. Half-grown: stuffed.

bb. A round black or white spot on each side of the body.

15. Chætodon tallii.

Bleeker, Banda, iii. p. 97.

D. $\frac{12}{25}$. A. $\frac{3}{21}$. L. lat. 25.

The snout is pointed; the præoperculum not denticulated; the dorsal and anal fins rounded posteriorly. The ocular band is as wide as the orbit, extends from the origin of the dorsal to the throat, and is edged with white. Body with oblique blackish transverse stripes; on each side of the back, below the anterior half of the soft dorsal, a blackish blotch; tail with a broad blackish cross-band; dorsal with a narrow black margin; ventrals and caudal transparent violet. (*Bl.*)

Sea of Banda Neira.

16. Chætodon unimaculatus.

Bloch, t. 201. f. 1; *Bl. Schn.* p. 221; *Cuv. & Val.* vii. p. 72; *Cuv. Règne Anim. Ill. Poiss.* pl. 39. f. 3 (not good); *Bleek. Banda,* i. p. 241.

D. $\frac{13}{22}$. A. $\frac{3}{20}$. L. lat. 46. L. transv. 8/19. Vert. 10/14.

The snout is very slightly produced, and rather longer than the diameter of the eye; præoperculum not denticulated; the dorsal and anal fins rounded posteriorly. The black ocular band is continued over the chest, and as broad as the diameter of the eye; a narrower vertical band over the posterior margins of the dorsal and anal, and across the tail; a large round black spot on the lateral line, below the six posterior spines; the remainder of the body and the fins uniform.

Molucca Sea; Polynesia.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Adult: skeleton. Amboyna. Purchased of Mr. Frank.
c. Adult: bleached. Old Collection.

The *skeleton* differs from that of *Ch. strigangulus* in the following points:—The bones are more elongate in the vertical direction; the length of the lower limb of the præoperculum is nearly one-half that of the posterior; the operculum is three times as high as wide. The cavity for the pectoral muscles is rather shallow, but very broad. The interior of the three lamellæ of the pubic bones is the most developed, the inferior the least, but posteriorly with a swelling for the articulation of the ventral spine. The length of the abdominal portion of the vertebral column is very little less than that of the caudal; the first interhæmal is very long, as long as the first seven vertebræ together.

17. Chætodon bennetti.

Chætodon bennetti, *Cuv. & Val.* vii. p. 84; *Bleek. Batav.* p. 467.
—— vinctus, *Benn. Voy. Beech.* p. 62. pl. 17. f. 1 (faulty).

D. $\frac{14}{17}$. A. $\frac{3}{15-16}$. L. lat. 40.

The snout is obtuse, nearly equal in length to the diameter of the eye; præoperculum indistinctly denticulated at the angle; anal and dorsal fins rounded posteriorly. The ocular band is narrower than the orbit, reaches from the nape of the neck to the lower margin of the interoperculum, and is edged with silvery-white. A large round, black, white-edged spot on each side of the back, below the posterior dorsal spines; two oblique pearl-coloured bands descend from the operculum towards the anal fin, one above the root of the pectoral, the other below; the soft dorsal and anal and the caudal with a broad blackish margin.

Molucca Sea.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.

The figure quoted represents erroneously nine dorsal spines, and has served for the description given by Cuvier.

18. Chætodon speculum.

Chætodon speculum, (*Kuhl & van Hass.*) *Cuv. & Val.* vii. p. 73; *Bleek. Banda*, i. p. 242.
? Chætodon spilopleura, (*Reinw.*) *Cuv. & Val.* vii. p. 74.

D. $\frac{14}{17}$. A. $\frac{3}{15}$. L. lat. 40.

The dorsal and anal fins are rounded posteriorly. The ocular band is continued over the chest. An ovate black spot of the size of the head, on the back, below the middle of the dorsal fin; caudal edged with brown.

Molucca Sea.

19. Chætodon capistratus.

Seba, iii. 25. 16, ? iii. 26. 35.
Chætodon capistratus, *L. Mus. Ad. Fried.* tab. 33. f. 4; *L. Syst. Nat.* p. 465; *L. Gm.* p. 1252; *Bl.* t. 205; *Bl. Schn.* p. 222; *Risso, Eur. Mérid.* iii. p. 432; *Cuv. & Val.* vii. p. 64; *Gronov. Syst. ed. Gray*, p. 67.
Tetragonopterus, sp., *Klein, Miss.* iv. p. 37. no. 2. t. 11. f. 5.
Duhamel, Pêches, ii. sect. 4. pl. 13. f. 2.

D. $\frac{13\,(12)}{19}$. A. $\frac{3}{17}$. L. lat. 42. L. transv. 6/17. Cæc. pylor. 8.

The snout is very slightly produced, and nearly equal in length to the diameter of the eye; præoperculum very indistinctly serrated. The soft dorsal and anal angular posteriorly. The black ocular band is white-edged, much narrower than the eye, and extends over the interoperculum, not over the chest. A round black, white-edged spot immediately before the angle made by the dorsal fin and the back of the tail; blackish oblique streaks along the series of scales, those of the upper half of the body descending forwards, those of the lower ascending forwards. A greyish band edged with black across the middle of the caudal, and continued on the soft dorsal and anal fins, where it runs parallel to, and near the margin; ventrals whitish.

Atlantic coasts of Tropical America.

a. Adult: skin. Jamaica. From Dr. Parnell's Collection.
b. Adult. Trinidad. Presented by J. B. Richardson, Esq.
c. Adult. Puerto Cabello. Purchased of Mr. Brandt.
d. Adult: not good state. Demerara. Presented by Dr. Smith.
e. Adult: stuffed.
f. Half-grown: stuffed.
g. Adult: skin. From Gronov's Collection.

20. Chætodon quadrimaculatus.

Gray, Zool. Miscell. p. 33.

D. $\frac{14}{22}$. A. $\frac{3}{17}$. L. lat. 40. L. transv. 8/17.

The snout is very slightly produced, and scarcely longer than the diameter of the eye; the dorsal and anal fins with the posterior angle rounded. The ocular band begins from the nape of the neck, is as broad as the orbit, black above the eye, yellowish, edged with brown beneath. The dark brown coloration of the back is separated from the ocular band by another yellow one. The upper half of the body dark brown, with two white blotches on each side, one below the middle of the spinous dorsal, the other below the middle of the soft. The soft dorsal and anal with a brown-edged inframarginal stripe; ventrals and caudal yellowish.

Sandwich Islands.

a. Adult: skin: not good state. Sandwich Islands. From the Collection of the Zoological Society.—Type of the species.

β. Without a round black spot.

aa. Body with distinct longitudinal bands.

21. Chætodon meyeri.

Valent. iii. p. 455. f. 347; *Renard*, i. 25. 135.
Chætodon meyeri, *Bl. Schn.* p. 223; *Cuv. & Val.* vii. p. 19; *Cuv. Règne Anim. Ill. Poiss.* pl. 37. f. 2; *Bleek. Act. Soc. Nederl.* i. *Amboina*, p. 37.
Holacanthus flavo-niger, *Lacép.* iv. pp. 529, 538. pl. 13. f. 2.

D. $\frac{12}{23}$. A. $\frac{3}{20}$. L. lat. 52. L. transv. 7/27. Vert. 10/14.

The snout is obtuse, but longer than the diameter of the eye; præoperculum scarcely denticulated; the vertical fins rounded posteriorly. Body, head, and fins with curved black stripes: one across the lower lip; the second round the snout; the third from the nape of the neck through the eye to the base of the ventrals: these stripes are yellow-edged; the fourth from the first dorsal spine to the suprascapula; the fifth along the upper margin of the dorsal, bent downwards to the præopercular margin, and from hence along the abdomen and the basal half of the anal; the sixth concentric with the former, touching the opercular margin and the root of the pectoral, and proceeding to the upper part of the root of the caudal; the seventh, eighth and ninth also are curved, and radiate from the root of the pectoral; caudal with two narrow cross-stripes; operculum with a vertical white streak.

Molucca Sea.

a. Adult. Celebes. Purchased of Mr. Frank.
b. Adult: skeleton. Amboyna. Purchased of Mr. Frank.
c. Half-grown. Amboyna. Purchased of Mr. Frank.
d, *e*. Adult. Java. Purchased of Mr. Jamrach.
f. Adult. Moluccas.
g. Adult. Presented by G. Bennett, Esq.
h. Adult. From the Collection of the Zoological Society.

Skeleton.—The maxillary bone is very irregularly shaped; two portions can be distinguished in it, a superior and an inferior, separated from each other by the narrower middle of the bone. The upper portion has posteriorly a large condyle for the articulation with the palatine; the lower portion is of less extent than the upper one, and not quite so broad. A long and slender process, directed forwards, extends from the palatine bone across the centre of the maxillary, forming a notch in the præorbital. The anterior portion of the intermaxillary, in which the teeth are implanted, is swollen; the posterior process is much longer than the descending branch. The mandibula appears to be composed of two bones only, the dentary and the articular, one situated before the other; the former presents a very singular aspect: it is excavated anteriorly, and holds the hair-like teeth, like the quill of a camel-hair brush. The articular bone is triangular, and forms the posterior part of the mandibula.

The upper portion of the skull appears as a solid, elevated, rounded, smooth bony mass, with some pores above the posterior part of the orbit. Sutures are visible between the principal frontal bones, the supraoccipital, the parietals, and the suprascapulæ. The supraoccipital is continued posteriorly in an elevated and strong crest, which has the upper margin swollen, and is posteriorly bifurcate to receive the first interneurals. The anterior frontal bones are scarcely to be distinguished from the principal frontals; the orbital margin is very slightly serrated.

The turbinal bones are well developed. *It is a peculiarity of the skeleton of Chætodon* and the genera allied to it, that the posterior portion of the infraorbital ring is firmly united with the interior ridge of the præoperculum. This portion is composed of three narrow bones in the present species, and is as long as the anterior part of the ring, which is formed by two quadrangular bones only, the præorbital included. The outer surface of these bones is rough and porous. The præoperculum is smooth, with the muciferous channel merely indicated, and with the interior ridge not elevated; the inferior limb is one-half the length of the posterior, and has the margin finely serrated. The operculum has neither ridge nor spine, is subquadrangular, 2½ as high as wide; the posterior side is subvertical. The sub- and interoperculum are very obliquely situated; the former is small, the latter broader anteriorly than posteriorly. The suprascapula is firmly joined to the bones of the skull: the humerus is very developed, sword-shaped, and reaches downwards to the ventrals: the coracoid is exceedingly broad, and especially the cavity for the muscles of the pectoral fin; this cavity is rather shallow. There is a very small cleft between the ulna and coracoid. The lamellæ of the pubic bones are nearly equally developed; the lower is posteriorly swollen for the articulation with the ventral spine.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·35. The ribs are strong and broad, and provided at the base with epipleural spines. The longest neural and hæmal spines are those of the middle vertebræ, and the latter are longer than the former. There are two spurious interneurals, which are received in a fork, formed by the occipital crest; they are provided superiorly with a spine, directed forwards, and covering the crest like tiles. Each neural and interneural spine belonging to the spinous dorsal is dilated into a transparent lamella, firmly joined to the spine next to it. The hæmal spine of the second caudal vertebra is the strongest, compressed, and partially united with the spines of the first and third caudal vertebræ. In a similar way, the interhæmals of the anal spines are anchylosed together and with the corresponding hæmals.

The skeleton from which the above description is taken appears to have been that of a very old fish.

22. Chætodon ornatissimus.

Chætodon ornatissimus, (*Solander*) *Cuv. & Val.* vii. p. 22; *Less. Voy. Coq. Zool.* ii. p. 179. pl. 30. f. 1 (not good); *Bleek. Act. Soc. Nederl.* ii. *Amboina*, p. 55.

Chætodon ornatus, *Gray, Zool. Miscell.* p. 33, *and in Griff. Anim. Kingd.* x. p. 323. pl. 20.

D. $\frac{12}{24-26}$. A. $\frac{3}{22}$. L. lat. 55. L. transv. $\frac{10}{25}$.

The snout is a little pointed, and rather shorter than the diameter of the eye; præoperculum minutely denticulated; the dorsal and anal fins rounded posteriorly. Head with six black vertical bands, edged with yellow: the first across the lower lip; the second round the snout; the third through the eye; the fourth across the præoperculum, continued into a line running below, and parallel to the margin of the dorsal fin; the fifth from the suprascapula over the operculum to the suboperculum; the sixth very narrow, along the opercular membrane. Body with seven oblique, yellow longitudinal bands, the five upper of which terminate at the base of the dorsal fin; the sixth to the back of the tail; the seventh to the anal fin. The soft dorsal with a black edge, besides the black line; the anal with black, yellow and black marginal bands; caudal with a black cross-band near the base and near the posterior margin; ventrals yellowish.

From the Molucca Sea to Polynesia.

a. Adult: stuffed. Sandwich Islands. Purchased.—Type of *Ch.*

ornatus. The interior black streak along the margin of the anal very broad.

b. Fine specimen. Amboyna. Purchased of Mr. Frank.—The interior black streak along the margin of the anal thread-like.

23. **Chætodon fremblii.**

Chætodon fremblii, *Benn. Zool. Journ.* iv. p. 42.
—— frehmlii, *Cuv. & Val.* vii. p. 24.

D. $\frac{13}{21}$. A. $\frac{3}{17}$. L. lat. 50. L. transv. 10/23.

The snout is slightly produced, and rather longer than the diameter of the eye; the dorsal and anal fins rounded posteriorly. Body with seven rather oblique, bluish, darker-edged longitudinal stripes; the fourth and fifth form a border to a large brown blotch, which occupies the posterior third of the soft dorsal and the narrower part of the tail; a brownish spot before the first dorsal spine; ventrals whitish.

Sandwich Islands.

a. Adult. From the Collection of the Zoological Society.—Type of the species.

b. Adult: stuffed.

24. **Chætodon mitratus.**

D. $\frac{13}{19}$. A. $\frac{3}{14}$. L. lat. 35. L. transv. 6/15.

The snout is moderately produced; the præoperculum entire; the dorsal and anal fins rounded posteriorly. The ocular band crosses the head above the orbits and does not extend to the interoperculum. A broad oblique brown band from the nape of the neck towards the soft portion of the anal, which is not reached by it; a second, parallel, along the back to the lower side of the tail; caudal, anal, and ventral fins yellowish, the dorsal with a fine brown inframarginal line.

Hab. ——?

a. Stuffed. Probably from Dr. Janvier's Collection, who collected at the Mauritius.

Description of the specimen.—Although the specimen is somewhat deformed by stuffing, and has the pectoral and caudal fins mutilated, I do not hesitate to found a new species on it, its characters being so very distinct. The greatest height of the body is $1\frac{2}{3}$ in the length, without caudal. The snout appears to be rather produced and slightly pointed. The dorsal has only a thin coat of scales, and its anterior part is nearly free; the spines are very strong, and increase to the fourth, which is $1\frac{1}{3}$ in the length of the head; the following gradually become shorter to the eighth, the ninth to the thirteenth being nearly equal. The soft portion of the fin is not elevated and rounded posteriorly. The second anal spine is the longest and equals the fourth of the dorsal. The soft portion is rather higher than the soft dorsal.

The extent of the ocular band below the orbit is not very distinctly visible.

	inches.	lines.
Length without caudal	3	7
Height of the body	2	1
Length of the head	1	2
——— of the fourth dorsal and of the second anal spine	0	11

bb. Body with broad cross-bands.

25. Chætodon falcula.

Bloch, ix. p. 102. t. 426. f. 2; *Bl. Schn.* p. 225; *Cuv. & Val.* vii. p. 41 *Bleek. Batoe,* p. 311.

D. $\frac{12}{26-27}$. A. $\frac{3}{22}$. L. lat. 25.

The snout is produced, pointed, and longer than the diameter of the eye; præoperculum scarcely denticulated; dorsal and anal fins rounded posteriorly. The ocular band is not wider than the orbit, white-edged; body with two black falciform bands, anteriorly white-edged, the first from the anterior part of the dorsal fin to below the lateral line, the second from the posterior part of the spinous dorsal and from the anterior of the soft; twelve or thirteen subvertical violet stripes besides; tail with a black cross-bar, white-edged; the soft dorsal and caudal with a black intramarginal stripe; anal with a black margin.

Sea of Batoe.

26. Chætodon dizoster.

Cuv. & Val. vii. p. 527; *Cuv. Règne Anim. Ill. Poiss.* pl. 39. f. 2.

Snout produced, pointed, much longer than the diameter of the eye; the dorsal and anal fins with the posterior angle rounded. The ocular band is rather narrower than the orbit and crosses the chest; the anterior and lower part of the body violet, the posterior and upper yellow. Body crossed by narrow dark vertical lines; a black cross-band from the anterior three dorsal spines to below the lateral line; another black band from the posterior four dorsal spines along the base of the soft dorsal to the back of the tail; a black band round the tail; the vertical fins with a blackish inframarginal line; ventrals whitish. (*Val.*)

Sea of Mauritius.

27. Chætodon octofasciatus.

Klein, Miss. iv. tab. 9. f. 3; *Seba,* iii. 25. 12.

Chætodon octofasciatus *L. Gm.* i. p. 1262; *Bl.* tab. 215. f. 1; *Bl. Schn.* p. 223; *Cuv. & Val.* vii. p. 17; *Bleek. Verhand. Batav. Genootsch.* xxiii. *Chætodont.* p. 16.

Chætodon octo-lineatus, *Gronov. Syst. ed. Gray,* p. 69.

D. $\frac{11}{19}$. A. $\frac{3}{17}$. L. lat. 50. L. transv. 12/24.

The snout is obtuse, and equal in length to the diameter of the eye; præoperculum entire; the dorsal and anal fins rounded posteriorly. Head, body, and fins with three pairs of brown cross-streaks; a single brown streak from the symphysis of the upper jaw to the nape of the neck; another vertical streak over the tail (where it is broadest), and over the soft portions of the dorsal and anal fins: the anterior streak of the first pair is the ocular band, which, half as wide as the orbit, extends over the chest. Ventrals white; caudal with a blackish cross-band near the base.

East Indian Seas.

a, b. Fine specimens. Singapore.
c. Adult: skin. From Gronov's Collection.

28. **Chætodon ulietensis.**

Cuv. & Val. vii. p. 39; *Bleek. Act. Soc. Nederl.* i. *Amboina*, p. 38.

D. $\frac{12}{24}$ A. $\frac{3}{20}$. L. lat. 30.

The snout is pointed; præoperculum crenulated at the lower margin; dorsal and anal fins rounded posteriorly. The ocular band is nearly as broad as the orbit, and extends over the interoperculum from the middle of the neck; snout brownish-violet; forehead with small white cross-streaks. Body with two very broad violet cross-bands, the anterior from between the fourth and eighth dorsal spines to behind the root of the pectoral, the posterior from the origin of the soft dorsal to the anterior half of the anal; there are, moreover, about seven blackish streaks crossing the body, on, and between, the bands described; tail with a black cross-band. The soft dorsal with a light brownish band and a brown edge; the soft anal with two light-brown bands and with a blue and blackish edge; caudal with a black cross-band near the margin, which is transparent; ventrals yellow. (*Bl.*)

Seas of Amboyna, Ternate, and Ulietea.

29. **Chætodon robustus.**

D. $\frac{12}{22}$. A. $\frac{3}{18}$. L. lat. 35. L. transv. 5/15.

The snout is moderately produced and somewhat conical; the lower præopercular margin slightly denticulated; the dorsal and anal fins rounded posteriorly. The ocular band is much narrower than the eye, and reaches over the interoperculum. A brown vertical band from the third and fourth dorsal spines to behind the base of the pectoral; another much broader one is white-edged, and extends from the tips of the last five dorsal spines over all the soft dorsal downwards to the posterior third of the base of the anal; a narrow brown band round the free portion of the tail; a single brown streak along the middle of the upper surface of the head. Caudal, anal, and ventral fins white (in spirits).

a. Adult. From the Haslar Collection.

Description of the specimen.—This species has the body much elevated, its greatest height being nearly two-thirds of the total length. The upper profile descends abruptly from the origin of the dorsal, and is rather concave above the orbit. The lower profile also is concave beneath the angle of the mouth. The snout is moderately produced, as long as the diameter of the eye or as the distance between the orbits. The angle of the præoperculum is nearly a right one, and its lower margin is slightly denticulated. The spines of the fins are rather strong; those of the dorsal increase in length to the fourth, which is two-thirds of the length of the head; the following gradually become shorter, and the last is not quite the length of the first ray. The soft portion is not elevated and rounded posteriorly. The caudal is truncated. The second anal spine is the longest and strongest; it equals the fourth of the dorsal. The soft portion of the anal is very much like the corresponding opposite fin, but rather lower. The pectoral reaches to the vertical from the vent, the ventral to that from the anal.

The scales are large, especially those between the spinous dorsal and the lateral line. One of the largest covers two-thirds of the eye.

I may add to the description of the colours given above, that the ocular band appears rather lighter below the orbit; that each scale of the trunk, within and without the brown band, has a silvery spot; that the posterior band occupies all the soft dorsal, with the exception of a light edge and a fine brownish inframarginal line, whilst it does not extend on to the anal. The colours, however, have a little faded.

	inches.	lines.
Total length	7	0
Height of the body	3	9
Length of the head	1	8
Diameter of the eye	0	6
Length of the fourth dorsal and of the second anal spine	1	2

30. Chætodon humeralis.

D. $\frac{13}{19}$. A. $\frac{3}{16}$. L. lat. 30. L. transv. 5/17.

The snout is very slightly produced; the lower præopercular margin denticulated; the dorsal and anal fins rounded posteriorly. The ocular band is much narrower than the eye, and reaches over the interoperculum. A brown vertical band from the first, second and third dorsal spines to and below the base of the pectoral, touching the opercular margin; another from the tips of the last five dorsal spines across the base of the soft dorsal and across the tail to the middle of the base of the soft anal. The soft dorsal and anal white, with a brown inframarginal band; caudal with a brown band at the base, a brown crescent in the middle, and a white cross-streak behind the crescent.

Sandwich Islands.

a, *b*. Half-grown. Sandwich Islands.
c, *d*. Adult. From the Haslar Collection
e. Adult. From the Haslar Collection.

Description.—This species is closely allied to *Ch. robustus*, but may be readily distinguished by a different arrangement of the cross-bands, by the banded caudal fin, and by the different numbers of the fins. The greatest height of the body is $1\frac{3}{5}$ in the total length. The upper profile descends abruptly from the origin of the dorsal, and is very slightly concave above the orbit. The lower profile exhibits scarcely any concavity. The snout is slightly produced, as long as the diameter of the eye or as the distance between the orbits. The angle of the præoperculum is nearly a right one, and its lower margin is slightly denticulated. The spines of the fins are rather strong: those of the dorsal increase in length to the fourth, which is two-thirds the length of the head; the following gradually become shorter to the eleventh, the last three being equal and rather shorter than the first ray. The soft portion of the fin is not elevated and rounded posteriorly. The caudal is truncated. The second anal spine is the longest and strongest, rather shorter than the fourth dorsal spine. The soft portion of the anal is very much like the corresponding part of the opposite fin, but rather lower. The ventral reaches to, the pectoral nearly to, the vertical from the vent.

The scales are large, especially those in the middle of the side of the body; one of the largest covers five-sixths of the orbit.

I may add to the description of the colours given above, that there is an indistinct single brownish streak along the middle of the snout and forehead; that the brown inframarginal band of the anal originates at the base of the first spine: and that the greater portion of the soft dorsal and anal are white, like the body (in spirits).

	inches.	lines.
Total length	5	4
Height of the body	3	3
Length of the head	1	6
Diameter of the eye	0	5
Length of the fourth dorsal spine	1	$0\frac{1}{2}$
——— of the second anal spine	0	11

31. Chætodon gracilis.

D. $\frac{13}{23}$. A. $\frac{3}{19}$. L. lat. 38. L. transv. 7/17.

The snout is moderately produced and somewhat conical, the angle and the lower margin of the præoperculum very slightly denticulated; the dorsal and anal fins rounded posteriorly. The ocular band is narrower than the orbit, edged with white, and reaches over the interoperculum; a brown, white-edged vertical band from the extremity of the dorsal across the tail over the posterior half of the soft anal. The remainder of the fish whitish (in spirits).

Caribbean Sea.

a, b. Adult. West Indies. From Mr. Scrivener's Collection.
c. Adult. West Indies. From Mr. Scrivener's Collection.

Description.—This species has the body moderately elevated, its greatest height being about one-half of the total length. The upper profile of the head is very slightly concave above the orbit, and the lower ascends as much as the upper descends. The length of the snout equals the diameter of the eye, the width between the orbits being rather less. The angle of the præoperculum is nearly a right one, and, like the lower margin, slightly denticulated. The dorsal spines are moderately strong, and increase in length to the fourth and fifth, the length of which is rather more than one-half that of the head. The following spines are very little shorter, and the last equals in length the first ray. The soft portion of the fin is not elevated and rounded posteriorly. The caudal is truncated. The anal spines are strong; the second is rather longer than the third or than the dorsal spines, two-thirds the length of the head. The soft portion of the anal is very much like the corresponding part of the opposite fin, but rather lower. The pectoral does not extend to the vertical from the vent, the ventral reaches nearly to it. The scales are of moderate size; those between the pectoral and the lateral line are the largest, one of them covering about one-half of the eye.

I may add to the coloration stated above, that there is a shining silvery spot on the operculum, perhaps of a colour different from the ground colour in life; that the brown band occupies the smaller portion of the soft dorsal, sometimes the posterior extremity only, whilst on the anal it may extend forwards to the spines. The soft dorsal has a fine brown marginal line posteriorly. The other fins are uniform white.

	inches.	lines.
Total length	4	2
Height of the body	2	2
Length of the head	1	0
Diameter of the eye	0	4
Length of the fourth dorsal spine	0	7
——— of the second anal spine	0	8

cc. Body without bands, with stripes or spots, or uniform.

aa. Ventrals dark-coloured.

32. Chætodon collaris.

Seba, iii. 25. 10.
Chætodon collaris, *Bl.* taf. 216. f. 1; *Bl. Schn.* p. 223; *Cuv. & Val.* vii. p. 53; *Bleek. Verhand. Batav. Genootsch.* xxiii. *Chætod.* p. 19.
Chætodon unifasciatus, *Gronov. Syst. ed. Gray*, p. 69.

D. $\frac{12}{26}$. A. $\frac{3}{21}$. L. lat. 35. L. transv. 7/18.

The snout is obtuse and little longer than the diameter of the eye; præoperculum serrated; the soft dorsal and anal fins with the posterior angle rounded. Body with many yellowish oblique and longitudinal streaks, following the series of the scales. The ocular band as broad as the eye, extending from the occiput to the root of the ventrals, posteriorly on the neck with a broad dark brown transverse blotch; the band has a yellow edge anteriorly and posteriorly. Ventrals brown; the soft dorsal and anal and the caudal whitish, the two latter with a fine brownish line near the margin.

Japan?

a. Adult.
b. Adult. Old Collection.

33. Chætodon prætextatus.

Cant. Catal. p. 156. pl. 3.

D. $\frac{12}{26-28}$. A. $\frac{3}{20-22}$.

The snout is moderately produced, and much longer than the diameter of the eye; dorsal and anal rounded posteriorly. The white ground colour of the head nearly suppressed by broad black bands: one round the extremity of the snout; the second oblique, round the snout, behind the mouth; the third, the ocular band, broader than the eye, and divided into two by a white streak above the eye; the fourth occupying the operculum. The soft dorsal with a red, white and black, the anal with a red and black margin; a black cross-band on the middle of the caudal; ventrals black. Body uniform.

Sea of Pinang.

Three typical specimens, in the Collection of the East India Co.

34. Chætodon reticulatus.

Cuv. & Val. vii. p. 32. pl. 171; *Less. Voy. Coq. Zool. Poiss.* p. 178. pl. 30. f. 2.

D. $\frac{12}{27}$. A. $\frac{3}{22}$.

The snout is very little produced, and nearly equal in length to the diameter of the eye; the dorsal and anal fins with the posterior angle slightly rounded. Snout black, the margin of the lips yellow; the ocular band as broad as the orbit, occupying the whole neck, and extending to the root of the ventrals, which also are black. The scales of the body with a brown margin. The soft dorsal and anal with a yellow and black edge; the caudal with the base blackish, and with two black cross-streaks near the posterior margin. (*Cuv.*)

Polynesia.

35. Chætodon kleinii.

Klein, Miss. iv. tab. 10. f. 2. 255.
Chætodon kleinii, *Bloch*, tab. 218. f. 2; *Bl. Schn.* p. 225.
—— virescens, *Cuv. & Val.* vii. p. 30; *Bleek. Verh. Batav. Genootsch.* xxiii. *Chætodont.* p. 18.
—— flavescens, *Benn. Proc. Comm. Zool. Soc.* i. p. 61.

D. $\frac{13\,(12)}{22-25}$. A. $\frac{3}{18-20}$. L. lat. 33. L. transv. 5/11.

The snout is obtuse, and about equal in length to the diameter of the eye; præoperculum entire; the dorsal and anal fins rounded posteriorly. The ocular band extends from the first dorsal spine to the extremity of the ventral fins, and is nearly as wide as the orbit; the extremity of the snout and the margins of the soft dorsal, anal, and caudal fins blackish; the remainder uniform yellowish (in spirits; the black colour of the ventral disappears sometimes in dried specimens).

Indian Ocean and Archipelago.

a, b. Adult. Amboyna. Purchased of Mr. Frank.
c, d. Adult: not good state. Purchased of Mr. Frank.
e. Young. Java. Purchased of Mr. Jamrach.
f. Adult. Mauritius. From the Collection of the Zoological Society.—Type of *Ch. flavescens.*
g, h. Adult: stuffed.

36. Chætodon reinwardtii.

Chætodon melanotus, (*Reinw.*) *Cuv. & Val.* vii. p. 71 (not *Schneid.*)

D. $\frac{12}{25}$. A. $\frac{3}{13}$.

The snout is pointed. Uniform yellowish, with an ocular band, two black spots on the caudal fin, black ventrals, and with the dorsal and anal black-edged. (*Cuv.*)

Molucca Sea.

ββ. Ventrals light-coloured.

* Caudal with a black cross-band or crescent.

37. Chætodon vittatus.

Renard, i. 20. 109; *Valent.* iii. p. 378. f. 93, p. 494. f. 450, *Seba,* iii. 29. 18
Chætodon trifasciatus, [*Mungo Park, Trans. Linn. Soc.* iii. p. 34]; *Lacép.* 10. p. 498.
—— vittatus, *Bl. Schn.* p. 227; *Cuv. & Val.* vii. p. 34; *Bleek. Verh. Batav. Genootsch.* xxiii. *Chætod.* p. 18.
—— austriacus, *Rüpp. N. W. Fische,* p. 30. taf. 9. f. 2 (var.).

D. $\frac{13}{21}$. A. $\frac{3}{20}$. L. lat. 38. L. transv. 5/13. Vert. 10/14.

The snout is short, obtuse, and equal in length to the diameter of the eye; præoperculum very indistinctly serrated; the dorsal and anal fins with the posterior angle rounded. Body with parallel and slightly oblique blackish streaks. Snout blackish, separated from the ocular band by a white streak; the ocular band white-edged, encircling the chest, much narrower than the orbit; a very narrow, blackish, anteriorly white-edged stripe behind, and parallel to the ocular band, along the præopercular margin. A cuneiform, black, yellow-edged band from the origin of the soft dorsal to the back of the tail, where it is broadest. A black, yellow-edged band along the base of the anal. The soft dorsal with an indistinct reddish band along its middle. Caudal crossed in the middle by a black, yellow-edged bar; ventrals whitish.

From the Red Sea to Polynesia.

a. Adult. Ceram. Purchased of Mr. Stevens.
b, c. Fine specimens. Amboyna. Purchased of Mr. Frank.

d. Adult female: skeleton. Amboyna. Purchased of Mr. Frank.
e, f. Adult: not good state. From the Haslar Collection.
g. Adult: bleached. Old Collection.

The *skeleton* differs from that of *Chætodon meyeri* in the following points:—The angular bone of the mandibula is larger than the dentary; the orbital margin of the anterior frontals shows no serrature whatever; the posterior portion of the infraorbital ring is exceedingly narrow, and separated from the inner ridge of the præoperculum by a slight interspace; the length of the inferior præopercular limb is more than one-half of the posterior; the suboperculum is elongate, although narrow; the interoperculum is subtriangular; the cavity for the pectoral muscles is broad and deep, and there is only a very small foramen between the ulna and coracoid.

38. Chætodon fasciatus.

Chætodon fasciatus, *Forsk*. p. 59; *L. Gm*. p. 1266; *Cuv. & Val*. vii. p. 61.
—— flavus, *Bl. Schn*. p. 225; *Rüpp. Atlas, Fische*, p. 40. taf. 9. f. 1.

D. $\frac{12}{25}$. A. $\frac{3}{19}$. L. lat. 36. L. transv. 6/12. Cæc. pylor. 7.
Vert. $\frac{10}{14}$.

The snout is produced, conical, longer than the diameter of the eye; præoperculum entire; the dorsal and anal fins with the posterior angle rounded. The ocular band crosses the upper surface of the head above the eyes, and is not continued to the neck or to the interoperculum; a broad white band behind the ocular band. Back blackish-brown; body with blackish bands obliquely descending forwards; the soft dorsal and anal are margined with black, and the former has a blackish band besides, near its base; the caudal with a light margin, and a black cross-bar near the margin; ventrals whitish.

Red Sea; China.

a. Adult: stuffed. Red Sea. From Dr. Rüppell's Collection.—The cross-bar on the caudal is nearly as broad as the light margin.
b. Adult: stuffed. China. Presented by J. R. Reeves, Esq.—The cross-bar on the caudal is nearly twice as broad as the light margin.

39. Chætodon pictus.

? *Klein, Hist. Pisc*. iv. t. 9. f. 2.
Chætodon pictus, *Forskal*, p. 65; *Bl. Schn*. p. 226; *Cuv. & Val*. vii. p. 55; *Bleek. Natuurk. Tydschr. Nederl. Indie*, 1851, ii. p. 177.
Russell, i. pl. 87, (var.) pl. 83.
Chætodon decussatus, *Cuv. & Val*. vii. p. 54; *Bleek. l. c*. xiii. p. 328.
—— vagabundus, *Benn. Fishes of Ceylon*, pl. 7 (not *L*.).

D. $\frac{13}{25}$. A. $\frac{3}{20}$. L. lat. 35.

The snout is slightly produced, and scarcely longer than the eye;

præoperculum minutely serrated; dorsal and anal angular posteriorly. Body with oblique streaks, the upper ones descending obliquely forwards, the lower ones ascending obliquely forwards; they do not cross each other. Ocular band nearly as broad as the eye, extending to the inferior margin of the interoperculum; the soft dorsal and anal, and the tail between them, blackish-brown; caudal white, with a blackish-brown crescent in the middle; anal with a fine lighter line near the margin; the posterior part of the ventrals greyish.

Red Sea; Indian Ocean and Archipelago.

a. Half-grown: not good state. Madras. Presented by J. C. Jerdon, Esq.

40. **Chætodon lunula.**

Pomacentrus lunula, *Lacép.* iv. pp. 507, 510, 513.
Chætodon lunula, *Cuv. & Val.* vii. p. 59. pl. 173; *Bleek. Gilolo,* p. 57.

D. $\frac{12}{26}$. A. $\frac{3}{19}$. L. lat. 33. L. transv. 8/14.

The snout is slightly produced, and rather longer than the diameter of the eye; præoperculum distinctly serrated; the soft dorsal and anal rather angular posteriorly. The black ocular band is broader than the eye, and terminates at the præopercular margins; the head behind this band is white; the neck and the anterior part of the back downwards to the base of the pectoral are blackish-brown, with three oblique white streaks. The upper margin of the dorsal and the lower of the anal are black; a black band along the base of the soft dorsal, widening and bent downwards to the tail, which is crossed by it; a whitish band along the concavity of the former; caudal with a rather narrow black cross-band near its posterior margin.

Indian Ocean and Archipelago; Polynesia.

a. Adult. Prince's Island.
b. Fine specimen. Amboyna. Purchased of Mr. Frank.
c. Fine specimen. From the Haslar Collection.
d. Adult: not good state. Old Collection.

41. **Chætodon vagabundus.**

Renard, i. 23. 126.
Chætodon vagabundus, *Linn. Mus. Ad. Fried.* ii. p. 71, and *Syst.* i p. 465; *L. Gm.* p. 1251; *Bl.* taf. 204. f. 2; *Bl. Schn.* p. 222; *Cuv. & Val.* vii. p. 50; *Bleek. Verhand. Batav. Genootsch.* xxiii. *Chætod.* p. 18 (not *Benn.*).

D. $\frac{13}{25}$. A. $\frac{3}{20}$. L. lat. 30. Vert. 10/14.

The snout is slightly produced, pointed, conical, and longer than the diameter of the eye; præoperculum scarcely denticulated; the soft anal and dorsal fins with the angle rounded. The ocular band is black, and terminates at the angle of the interoperculum. Body with oblique lines; those above the pectoral descending obliquely forwards, those above the anal ascending obliquely forwards. The dorsal with a narrow black margin, and a black band along the base of the soft portion, posteriorly bent downwards, crossing the tail and continued on a part of the anal. The anal with a narrow black and white margin; the caudal with two black cross-bands, the anterior of which is crescent-shaped.

From the Red Sea to Polynesia.

a. Adult. Mauritius. From the Collection of C. Telfair, Esq.
b. Adult: skeleton. Mauritius. From the Collection of C. Telfair, Esq.
c, d. Fine specimens. Amboyna. Purchased of Mr. Frank.
e. Adult. From the Haslar Collection.

Skeleton.—The configuration of the bones of the head is more like that of *Chætodon strigangulus* than that of *Ch. meyeri*. The lower jaw is elongate and rather low, the dentary being somewhat pointed; the præorbital is produced, and twice as long as high; the infraorbital ring, especially the posterior portion, is narrow, and the latter is joined to the inner ridge of the præoperculum. The inferior limb of the præoperculum is 1½ as long as the posterior, which ascends obliquely backwards; the operculum is subquadrangular, twice as high as wide, with the posterior side slightly emarginate; the suboperculum narrow, tapering posteriorly; the interoperculum oblong, irregularly quadrangular. The occipital crest is exceedingly high, and forked at its upper extremity, as described in *Ch. meyeri*. The length of the abdominal portion of the vertebral column is to that of the caudal as 1 : 1·3. The hæmal spines of the first and second caudal vertebræ are anchylosed together; the first and second interhæmals are separated. Epipleural spines none. There is a round foramen between the radius and coracoid, near the symphysis of the coracoids.

42. Chætodon guttatissimus.

Bennett, Proc. Comm. Zool. Soc. ii. p. 183.

D. $\frac{13}{22}$. A. $\frac{3}{19}$. L. lat. 32.

The snout is slightly produced, and rather longer than the diameter of the eye; præoperculum serrated; the dorsal and anal fins rounded posteriorly. The ocular band extends from the nape of the neck to the lower margin of the interoperculum; it is narrower than the eye above, and much narrower below the orbit; the upper portion is edged with yellow. Sides of the body yellow, each scale with a black spot; dorsal and anal purplish-brown, dotted with black and edged with yellowish; caudal with a black crescent across the middle; ventrals yellowish.

Sea of Ceylon.

a. Adult. Ceylon. From Dr. Sibbald's Collection.—Type of the species.
b. Adult: skin. Ceylon. From Dr. E. F. Kelaart's Collection.

43. Chætodon punctato-fasciatus.

Chætodon punctato-fasciatus, *Cuv. & Val.* vii. p. 28; *Bleeker, Banda,* i. p. 238.
—— punctato-lineatus, *Gronov. Syst. ed. Gray,* p. 70.

D. $\frac{13}{23}$. A. $\frac{3}{17}$. L. lat. 35. L. transv. 7/13.

The snout is very slightly produced, and rather longer than the diameter of the eye; præoperculum entire; the soft dorsal and anal fins rounded posteriorly. The ocular band is reduced to a pale, brown-edged streak, reaching from above the orbit to the margin of the præoperculum; a black spot on the nape of the neck. Back with about seven vertical brown bands; each scale of the sides with a brown central spot. Dorsal with a black and white marginal line, the margin being greyish; caudal yellow in the basal half and greyish in the marginal one, both colours being separated by a black band; anal with a black and white line, and with the margin yellow; ventrals yellow, with a blackish spot.

Sea of Banda.

a, b. Fine specimens. Purchased of Mr. Frank.
c. Adult: skin. From Gronov's Collection.

44. Chætodon rafflesii.

Renard, i. 8. 58; ? *Seba,* iii. 26. 36.
Chætodon rafflesii, *Benn. Life of Raffles,* p. 689.
—— princeps, *Cuv. & Val.* vii. p. 33; *Less. Voy. Coq. Zool. Poiss.* p. 177; *Bleek. Verhand. Batav. Genootsch.* xxiii. *Chætod.* p. 19.
? Chætodon sebæ, *Cuv. & Val.* vii. p. 52.

D. $\frac{13}{21}$. A. $\frac{3}{19}$. L. lat. 25. L. transv. 5/13.

The snout is produced, conical, and much longer than the diameter of the eye; præoperculum very indistinctly denticulated; the dorsal and anal fins rounded posteriorly. Body uniform; a black ocular band, rather narrower than the eye; the dorsal fin with a black margin, edged with white on both sides, and widening posteriorly; the anal with a black marginal line, and with the margin white; the caudal with a black crescent, the convexity being forwards, separated from the blackish margin by a yellow cross-band; ventrals white.

Molucca Sea; New Ireland.

a, b. Half-grown. Sumatra. Presented by Sir S. Raffles.—Types of the species.
c. Adult. Amboyna. Purchased of Mr. Frank.

45. Chætodon oxycephalus.

Bleeker, Ternate, ii. p. 603.

D. $\frac{12}{24}$. A. $\frac{3}{20}$. L. lat. 28.

The snout is produced, conical, and much longer than the diameter of the eye; præoperculum slightly denticulated; dorsal and anal fins rounded posteriorly. The extremity of the snout is black; the ocular band broader than the eye; a large black spot across the neck. Sides with slightly oblique violet cross-streaks; back with a broad oblique band from the end of the spinous dorsal to the tail. The soft dorsal with three curved longitudinal bands, the middle of which is reddish-violet; the upper and lower are black. and descend on the tail and the anal fin. Caudal with a brown cross-band anteriorly to the margin. (*Bl.*)

Sea of Ternate.

46. **Chætodon mesoleucus.**

Chætodon mesoleucus, *Forskal*, p. 61; *L. Gm.* p. 1266 (not *Bloch*); *Cuv. & Val.* vii. p. 56.
—— hadjan, *Bl. Schn.* p. 227.

D. $\frac{13}{22-23}$. A. $\frac{3}{19}$. L. lat. 27. L. transv. 7/13.

The snout is very produced, conical, and much longer than the diameter of the eye: præoperculum very indistinctly denticulated; the dorsal and anal fins angular posteriorly. The ocular band is narrower than the eye, and, below the eye, not continued to the præopercular margin. The anterior portion of the body to the fifth dorsal spine, with the ventral fins, milk-white; the posterior with fine vertical black streaks, following the series of scales, and occupying their anterior margin. The soft dorsal and anal brownish; the caudal whitish, with a brown crescent.

Red Sea.

a. Fine specimen.
b. Adult: stuffed. Red Sea. From Dr. Rüppell's Collection.

* Caudal with a fine black cross-streak.

47. **Chætodon dorsalis.**

Chætodon dorsalis, (*Reinw.*) *Cuv. & Val.* vii. p. 70; *Rüpp. Atl. Fische*, p. 41. t. 9. f. 2, and *N. W. Fische*, p. 28; *Bleeker, Banda*, i. p. 240.
—— marginatus, (*Ehrenb.*) *Cuv. & Val.* vii. p. 57.
—— abhortani, *Cuv. & Val.* vii. p. 58.

D. $\frac{12}{19}$ A. $\frac{3}{18}$. L. lat. 37. L. transv. 6/16.

The snout is very slightly produced, and nearly equal to the diameter of the eye; præoperculum indistinctly denticulated; the soft dorsal and anal rounded posteriorly. The black ocular band is much narrower than the eye, and extends over the interoperculum; its continuation on the chest is indicated by a black spot. The upper parts of the body brownish-black, the lower with oblique blackish streaks, following the series of the scales; a black spot on the back of the tail, another on its lower side, and a third at the anterior part of the base of the soft anal. The soft dorsal and anal and the caudal with a blackish marginal line, the margins themselves being yellowish in the former and greyish in the caudal; ventrals yellow.

From the Red Sea to Polynesia.

a, b. Fine specimens. Amboyna. Purchased of Mr. Frank.
c. Adult. Feejee Islands. Voyage of the 'Herald.'

48. **Chætodon ocellicauda.**

Cuv. & Val. vii. p. 69.

D. $\frac{12}{20}$. A. $\frac{3}{17}$. L. lat. 35. L. transv. 6/16.

Snout produced, longer than the diameter of the eye; the dorsal and anal fins rounded posteriorly. Body with darker streaks, descending obliquely forwards. The ocular band is much narrower than the eye, and reaches from the origin of the dorsal across the chest. A large black, white-edged spot on each side of the tail, occupying its whole depth. Ventrals white; dorsal and anal with a whitish margin; caudal with a narrow blackish streak across its middle.

Indian Ocean.

a. 1¼ inch long. Indian Ocean.
b. Adult. From the Collection of the Zoological Society.
c. ? Adult.

49. **Chætodon aureus.**

Chætodon aureus, *Temm. & Schleg. Faun. Japon. Poiss.* p. 81. pl. 42. f. 1; *Richards. Ichth. Chin.* p. 246.

D. $\frac{12}{25}$. A. $\frac{3}{20}$.

The snout is produced, and longer than the eye; præoperculum serrated; the dorsal and anal fins rounded posteriorly. The upper lip blackish; the ocular band is as wide as the orbit, and extends from the nape of the neck to the lower margin of the interoperculum; body with rather oblique, dark longitudinal streaks; dorsal and anal with black margins, separated by a yellow line from the ground colour; caudal with a whitish margin, separated from the ground colour by a black line; ventrals yellow. (*Schleg.*)

Sea of Japan.

50. **Chætodon xanthurus.**

Bleek. Act. Soc. Indo-Nederl. ii. *Amboina,* p. 53.

D. $\frac{13}{21-24}$. A. $\frac{3}{16-18}$. L. lat. 30.

The snout is slightly produced, pointed, and about equal in length to the diameter of the eye; præoperculum denticulated; the dorsal and anal fins with the posterior angle rounded. The ocular band is narrower than the orbit, edged with white, and reaches superiorly not to the nape of the neck, inferiorly to the inferior margin of the interoperculum; a horseshoe-like, black, white-edged spot across the neck. The anterior part of the body with oblique violet streaks, following the series of the scales; those of the upper parts descending forwards, those of the lower ascending forwards. A very broad yellow band occupying the posterior part of the body, with the tail and the greater portion of the soft dorsal and anal fins. The soft dorsal and anal with a black and yellow margin, the caudal with a fine blackish transverse line; ventrals yellowish.

Sea of Amboyna.

a. Fine specimen. From the Collection of the Zoological Society.
b. Adult: stuffed.

* Caudal with a blackish margin.

51. **Chætodon lineolatus.**

Chætodon lineolatus, *Cuv. & Val.* vii. p. 40; *Bleek. Floris*, p. 323.
—— lunatus, (*Ehrenb.*) *Cuv. & Val.* vii. p. 57; *Rüpp. N. W. Fische*, p. 30. t. 9. f. 3.
? Chætodon semilarvatus, (*Ehrenb.*) *Cuv. & Val.* vii. p. 39.—Young.

D. $\frac{12\,(13)}{26\text{–}27}$. A. $\frac{3}{21}$. L. lat. 28. L. transv. 5/14.

The snout is produced, conical, and much longer than the diameter of the eye; præoperculum entire; the soft dorsal and anal angular posteriorly. Ocular band broader than the eye, occupying the upper angle of the operculum, and extending on to the lower margin of the interoperculum; a triangular light spot on the nape of the neck, within the ocular band. A broad black band along the base of the soft dorsal fin, bent downwards across the tail, and continued and tapering on the posterior portion of the anal. Body with fine vertical blackish streaks, following the series of scales, near their roots. Caudal with a narrow blackish margin.

Red Sea; Sea of Floris.

a. Eleven inches long: stuffed. Red Sea. From the Frankfort Museum.
b. Adult: not good state. From the Haslar Collection.

52. **Chætodon selene.**

Bleeker, Solor, p. 76.

D. $\frac{12}{22}$. A. $\frac{3}{18}$. L. lat. 28.

The snout is produced, pointed, much longer than the eye; præoperculum with the angle minutely denticulated; the dorsal and anal fins rounded posteriorly. The ocular band is narrower than the orbit, and extends from the first dorsal spine to the lower margin of the interoperculum; it is black above the eye, brownish and yellow-edged beneath it. A broad black band along the base of the dorsal, descending to the middle of the anal; the soft dorsal and anal with a blue and violet inframarginal stripe; caudal violet in its posterior half; ventral white.

Seas of Lawajong (Solor) and Amboyna.

a. Adult. Amboyna. Purchased of Mr. Frank.

53. Chætodon miliaris.

Quoy & Gaim. Voy. Freyc. Zool. p. 380. pl. 62. f. 6 (?); *Cuv. & Val.* vii. p. 26; *Voy. Bonite, Poiss* p. 163. pl. 2. f. 2.

D. $\frac{13}{22}$. A. $\frac{3}{19}$.

The snout is slightly produced, and rather longer than the diameter of the eye; the dorsal and anal fins rounded posteriorly. The ocular band reaches from the origin of the dorsal to the lower margin of the interoperculum, and is narrower than the orbit. Yellowish: each scale with a blue spot; a blue band round the root of the caudal; caudal and ventrals yellowish, the former with the margin bluish.

Sandwich Islands.

* Caudal without dark transverse streaks, generally uniform.

54. Chætodon baronessa.

Renard, Poiss. Mol. i. pl. 43. f. 218; *Valent. Amb.* iii. f. 145.
Chætodon triangulum, (*Kuhl & v. Hass.*) *Cuv. & Val.* vii. p. 44.
—— baronessa, *Cuv. & Val.* vii. p. 45; *Bleek. Banda*, i. p. 239.

D. $\frac{11}{26}$. A. $\frac{3}{21}$. L. lat. 33. L. transv. 7/20. Vert. 10/14.

The snout is rather produced, short, conical, somewhat longer than the diameter of the eye; præoperculum very indistinctly serrated; the soft portions of the anal and dorsal fins very elevated, with the angle rounded. The ocular band extends to the base of the ventrals, another concentric brown band over the snout, and a third across the operculum and the side of the belly. Sides of the body with alternating lighter and darker stripes, angularly bent, with the angle pointing forwards. The soft dorsal and anal, the caudal, and the tail between those fins, blackish; the fins with a narrow lighter margin; a whitish line across the root of the caudal and the base of the anal, forming the continuation of the margin of the dorsal fin.

Sunda and Molucca Seas.

a. Adult. Molucca Sea. Purchased of Mr. Frank.
b, c. Fine specimens. Amboyna. Purchased of Mr. Frank.
d. Adult: skeleton. Amboyna. Purchased of Mr. Frank.
e. Adult. Ceram. Purchased of Mr. Stevens.
f, g. Adult. Java. Purchased of Mr. Frank.

The *skeleton* is exceedingly similar to that of *Chætodon vagabundus*, and differs from it by a more elevated operculum, its width being 2½ in its height. The interhæmals of the anal spines are anchylosed together.

55. Chætodon larvatus.

Chætodon larvatus, (*Ehrenb.*) *Cuv. & Val.* vii. p. 45; *Rüppell, N. W. Fische*, p. 28.
—— karraf, (*Ehrenb.*) *Cuv. & Val.* vii. p. 46.

D. $\frac{11}{27}$. A. $\frac{3}{22}$.

Sides of the body with alternating lighter and darker stripes, angularly bent, with the angle pointing forwards. Head red, with a black, white-edged ocular band. The posterior part of the body, including the soft dorsal and anal and the caudal fins, is black, the extremity of the caudal whitish; sometimes a white-edged spot of a deeper black at the root of the caudal.

Red Sea.

56. **Chætodon tau-nigrum.**

Cuv. & Val. vii. p. 38.

D. $\frac{13}{21}$. A. $\frac{3}{26}$.

The snout is short, obtuse, and equals in length the diameter of the eye. Body with blackish longitudinal streaks. Ocular band narrow; a black vertical streak between the extremities of the dorsal and anal fins, to which is joined a black triangle, the whole forming a mark like a T. Fins pale. (*Cuv.*)

Sea of Guam.

57. **Chætodon blackburni.**

Renard, f. 22. n. 121 (bad).

Chætodon blackburni, *Desjard. Compt. Rend. Soc. Hist. Nat. Ile de France*; *Cuv. Règne Anim. Ill. Poiss.* pl. 37. f. 3.

D. $\frac{16}{22}$. A. $\frac{3}{16}$. L. lat. 43. L. transv. 7/18.

The snout is slightly produced, and longer than the diameter of the eye; præoperculum indistinctly denticulated. The anterior dorsal spines are rather low, the length of the third being equal to that of the snout; the dorsal and anal fins posteriorly with an obtuse angle. The anterior portion of the body is light-coloured, with a brownish-black ocular band, narrower than the eye; the soft dorsal and anal fins, and the tail between, are brownish-black, the colour becoming deeper posteriorly. Six narrow dark stripes descend obliquely forwards towards the head and belly; pectoral, ventral, and caudal fins colourless (in spirits).

Sea of Ile de France.

a. Adult. From the Collection of the Zoological Society.

58. **Chætodon nigripinnis.**

Peters in Wiegm. Archiv, 1855, p. 246.

D. $\frac{14}{25}$. A. $\frac{3}{23}$.

The snout is pointed, prominent. Yellow, with a black ocular band and seven or eight black transverse stripes; the soft dorsal and anal, and the tail between, black; dorsal and anal with a yellowish margin. (*Pet.*)

Mozambique.

59. Chætodon citrinellus.

Renard, i. pl. 8. f. 59.
Chætodon citrinellus, (*Brouss.*) *Cuv. & Val.* vii. p. 27; *Règne Anim. Ill. Poiss.* pl. 39. f. 1; *Bleek. Sumatra*, iii. p. 501.

D. $\frac{14}{21}$. A. $\frac{3}{16}$. L. lat. 40. L. transv. 6/14.

The snout is slightly produced, and very little longer than the diameter of the eye; the dorsal and anal fins with a rounded angle posteriorly; præoperculum with exceedingly minute denticulations. Body yellowish; each scale with a blue spot in the centre, the spots forming together rather oblique series. The brown ocular band rather narrower than the eye, edged with yellow anteriorly and posteriorly; the anal with a broad yellow and black margin; caudal and ventral fins without any bands or spots.

Molucca Sea; Polynesia.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b, *c*. Adult and young. Feejee Islands. Voyage of H.M.S. Herald.

60. Chætodon luctuosus.

Quoy & Gaim. Voy. Freyc. Zool. p. 382; *Cuv. & Val.* vii. p. 37.

D. $\frac{14}{17}$. A. $\frac{3}{16}$.

The snout is short, obtuse, and equal in length to the diameter of the eye. Body with longitudinal streaks. (*Cuv.*)

Hab. ——?

61. Chætodon xanthocephalus.

Benn. Proc. Comm. Zool. Soc. ii. p. 182.

D. $\frac{12}{25}$. A. $\frac{3}{22}$. L. lat. 38. L. transv. 8/15.

The snout is moderately produced, conical, and longer than the diameter of the eye; præoperculum indistinctly serrated; dorsal and anal fins rounded posteriorly. The ocular band is rudimentary, and visible as a small spot only above and below the eye. Body brownish-yellow, with five indistinct, darker vertical streaks, the first from the fourth, the fifth from the ninth dorsal spine; dorsal and anal blackish, with white margin; caudal and ventral yellowish, the former with a violet membrane.

Sea of Ceylon.

a. Adult. Ceylon. Collected by Dr. Sibbald.—Type of the species.

62. Chætodon zoster.

Bennett, Proc. Comm. Zool. Soc. i. p. 61.

D. $\frac{12}{25}$. A. $\frac{3}{21}$.

Brownish-black; a broad zone in the middle, the belly, and the caudal white; no ocular band. (*Benn.*)

Sea of Mauritius.

B. Species with ten dorsal spines or less.

63. **Chætodon chrysozonus.**

Chætodon chrysozonus, (*Kuhl & v. Hass.*) *Cuv. & Val.* vii. p. 82; *Cuv. Règne Anim. Ill. Poiss.* pl. 38. f. 2; *Bleek. Verhand. Batav. Genootsch.* xxiii. *Chætodont.* p. 17.
—— labiatus, (*Kuhl & v. Hass.*) *Cuv. & Val.* vii. p. 83.
—— melanopus, *Cuv. & Val.* vii. p. 84.
—— guttatus, *Gronov. Syst. ed. Gray*, p. 71.

D. $\frac{8-10}{26-30}$. A. $\frac{3}{19}$. L. lat. 45. L. transv. 10–23.

The snout is very little produced, and equal in length to the diameter of the eye; præoperculum minutely denticulated; the dorsal and anal fins rounded; the ventrals reach to the third anal ray. Snout blackish; the ocular band prolonged backwards, nearly to the base of the ventrals; body with two very broad cross-bands; a round black spot, edged with white, in the middle of the soft dorsal; a black band round the base of the caudal; dorsal and anal with a bluish line, parallel to, and near the margin; ventral deep black.

Molucca Sea; Sea of China.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Adult: not good state. China. From the Haslar Collection.
c. Adult: skin. From Gronov's Collection.
d. Half-grown: skin. From Gronov's Collection.

64. **Chætodon oligacanthus.**

Bleeker, Verhand. Batav. Genootsch. xxiii. *Chætodont.* p. 16.

D. $\frac{6}{30}$. A. $\frac{3}{20}$. L. lat. 46.

The anterior part of the dorsal fin elevated, the sixth spine the longest. Yellowish, with five brownish vertical bands: the first through the eye, the second across the opercle, the third and fourth to the anal fin, the fifth on the tail; the fourth with a round black spot at the base of the dorsal fin, the fifth edged with yellow; a red band from the snout to the forehead.

East Indian Archipelago.

a. Adult. Purchased of Mr. Frank.
b, c. Half-grown: not good state. Singapore.
d. Half-grown. Philippine Islands. From Mr. Cuming's Collection.
e. Adult: not good state.
f. Young. From the Haslar Collection.

II. Scales small, in sixty or more transverse series.

65. **Chætodon strigatus.**

Chætodon strigatus, (*Langsd.*) *Cuv. & Val.* vii. p. 25. pl. 120; *Faun. Japon. Poiss.* p. 80. pl. 41. f. 1; *Bleek. Verhand. Batav. Genootsch.* xxvi. *Japan*, p. 94.

D. $\frac{11}{17}$. A. $\frac{3}{14}$. L. lat. 60. L. transv. 10/21.

The snout is scarcely produced, and equal to, or rather shorter than the diameter of the eye; præoperculum very distinctly denticulated; the soft dorsal not higher than the spinous, the height of which equals the distance between the posterior margin of the eye and the extremity of the muzzle. Body with five or six brown longitudinal bands, the first and second of which are continued on the soft dorsal, the fourth and fifth on the anal.

Seas of China and Japan.

a. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
b. Adult: stuffed: not good state. Japan.
c. Half-grown: bad state. From the Haslar Collection.

66. Chætodon polylepis.

Bleeker, Act. Soc. Indo-Nederl. ii. *Amboina,* p. 54.

D. $\frac{12}{24}$. A. $\frac{3}{19-20}$. L. lat. 60–65.

The snout is slightly produced, pointed, and rather shorter than the eye; præoperculum denticulated at the angle; dorsal and anal fins rounded posteriorly. Head yellowish-brown; body with two very broad oblique yellow bands: the anterior triangular, from between the third and ninth dorsal spines to the scapulary region, tapering to a point; the posterior convex, from the last three or four dorsal spines to the back of the tail, not extending below the lateral line.

Sea of Amboyna.

a, b. Adult: not good state. From the Haslar Collection.

67. Chætodon sexfasciatus.

Richardson, Ann. & Mag. Nat. Hist. x. 1842, p. 26

D. $\frac{10}{21}$. A. $\frac{3}{17-19}$. L. lat. ca. 90.

The snout is very slightly produced, its length being about equal to that of the diameter of the eye; præoperculum very distinctly serrated; the dorsal and anal fins are rounded posteriorly. Six brown vertical bands, the anterior of which goes through the eye from the nape of the neck to the root of the ventrals.

Coast of Western Australia.

a. Adult: stuffed. W. Australia. From Mr. Gould's Collection.—Type of the species.
b. Adult: skin: not good state. Purchased of Mr. Leadbeater.

2. CHELMO.

Chelmon, *Cuv. Règne Anim.*; *Cuv. & Val.* vii. p. 86.

Body much compressed and elevated. One dorsal, with nine and more spines, none of which are elongate. Muzzle produced into a long cylindrical tube, with a small anterior cleft of the mouth. No teeth on the palate; præoperculum without spine. Scales moderate or rather small.

Indian Seas. West coast of Australia. Polynesia.

1. Chelmo rostratus.

Seba, iii. pl. 25. f. 17.
Chætodon rostratus, *L. Mus. Ad. Fried.* i. p. 61. tab. 33. f. 2; *L. Gm.* p. 1244; *Bl.* tab. 202. f. 1; *Bl. Schn.* p. 221; *Shaw, Zool.* iv. p. 337. pl. 47; *Gronov. Syst. ed. Gray*, p. 73.
Jaculator, *Schlosser, Phil. Trans.* 1764, p. 39. pl. 9.
Chætodon enceladus, *Shaw, Nat. Misc.* p. 2. pl. 67.
Chelmon rostratus, *Cuv. Règne Anim.*; *Benn. Life of Raffles*, p. 689 *Cuv. & Val.* vii. p. 87; *Cant. Catal.* p. 158; *Cuv. Règne Anim. Ill. Poiss.* pl. 40. f. 1; *Bleek. Verhand. Batav. Genootsch.* xxiii. *Chætod.* p. 20.

D. $\frac{9}{30}$. A. $\frac{3}{21}$. L. lat. 47. L. transv. 9/20. Vert. 10/14.

The length of the snout (from the anterior margin of the orbit) is one-half the length of the head. Head and body with five brownish cross-bands, edged with brown and white; a round black white-edged spot in the middle of the soft dorsal, within the fourth cross-band; the fifth band black round the tail.

East Indian Seas. West coast of Australia. Entering rivers.

a. Adult. Celebes. Purchased of Mr. Brandt.
b–e. Adult. Singapore.
f. Adult: skeleton. Singapore.
g. Adult: bad state. India. Presented by General Hardwicke.
h, i. Young. Port Essington. From the Haslar Collection.
k. Adult. Presented by Sir J. Richardson.
l. Adult: skin. From Gronov's Collection.
m. Half-grown. Presented by Capt. Sir E. Belcher.
n. Half-grown: discoloured.

The *skeleton* differs from that of the following species by a shorter lower præopercular limb, its length being 1$\frac{3}{4}$ in that of the posterior.

2. Chelmo marginalis.

Richardson, Ann. & Mag. Nat. Hist. 1842, x. p. 29.

D. $\frac{9}{30}$. A. $\frac{3}{21}$. L. lat. 50. L. transv. 9/22. Cæc. pylor. 5. Vert. 10/14.

The length of the snout is one-half that of the head. Head and body with four brownish cross-bands, edged with brown and white; sometimes an indistinct blackish spot in the middle of the soft dorsal, within the third cross-band; the fourth band round the tail.

Perhaps a variety of *Ch. rostratus*, from the West coast of Australia.

a. Adult. Swan River.
b. Adult: skin. Port Essington. From Mr. Gilbert's Collection.—Type of the species.
c. Adult. From the Haslar Collection.
d. Adult: skeleton. From the Haslar Collection.
e. Half-grown. Australia. Presented by the Earl of Derby.

Skeleton.—The skull of *Chelmo* is at once distinguished by the peculiar prolongation of the jaw-bones, in which, however, the maxillary does not participate; the latter is very much like that of a species of *Chætodon,* short, with the lower extremity slightly dilated, anteriorly concave, posteriorly irregularly convex. A long and slender process, directed forwards, extends from the palatine bone across the upper extremity of the maxillary, and is received in a notch of the præorbital. The anterior portion of the intermaxillaries, as well as their posterior processes, are exceedingly elongated in a horizontal direction, and both bones together form a half-channel, similar to the bill of a bird, anteriorly with seven transverse bands of minute teeth; the anterior margin of the jaw, besides, is armed with a series of very small teeth. The articular and dentary bones of the mandibula are likewise exceedingly elongate; the latter is toothed like the intermaxillary, the articular anchylosed to the hypotympanic, præoperculum and interoperculum.

The other portions of the skeleton bear a great resemblance to *Chætodon.* The upper portion of the skull appears as a solid, elevated, rounded bony mass, with a groove above each orbit. Sutures are visible between the supraoccipital, principal frontal bone, and suprascapula. The supraoccipital is continued posteriorly in a very elevated and strong crest, which has the upper margin swollen, and is posteriorly bifurcate, to receive the hook-like process of the first interneural. The anterior frontal bones are not to be distinguished from the principal frontals; the orbital margin is crenulated.

The turbinal bones are well developed and elongate; the præorbital is oblong, twice as long as high; the remainder of the infraorbital ring is very narrow, and its posterior portion firmly united with the interior ridge of the præoperculum. The præoperculum has the interior ridge very slightly elevated, and the muciferous channel merely indicated; the limbs form an obtuse angle together, and the length of the inferior is $1\frac{1}{2}$ in that of the posterior; the margins are obtusely serrated. The operculum has neither ridge nor spine, is subquadrangular, and not quite twice as high as wide. The sub- and interoperculum are very obliquely situated; the former is small, the latter broader anteriorly than posteriorly. The suprascapula is firmly joined to the bones of the skull; the humerus is well developed and sword-shaped. The coracoid has the outer ridge considerably elevated, so that the cavity for the muscles of the pectoral appears rather deep; there is only a small ovate foramen between the coracoid and ulna, the bottom of the cavity being entirely bony. The lamellæ of the pubic bones are nearly equally developed; the lower is swollen posteriorly for articulation with the ventral spine.

There are ten abdominal and fourteen caudal *vertebræ,* the length of the former portion of the vertebral column being to that of the caudal as 1:1·5. The ribs are strong, anteriorly and posteriorly with a groove, and at the base with a small epipleural spine. The longest neural and hæmal spines are those of the middle vertebræ, and the latter are longer than the former. There are two very slender spurious interneurals. Each neural and interneural of the spinous dorsal is dilated into a transparent lamella, which in the latter is broad enough to touch that of the spine next to it. The anterior hæmal and interhæmal spines show the same structure as in *Chætodon meyeri*.

3. **Chelmo longirostris.**

Chætodon longirostris, *Broussonet.*
Chelmon longirostris, *Cuv. & Val.* vii. p. 89. pl. 175; *Bleek. Verhand. Batav. Genootsch.* xxiii. *Chætod.* p. 20.

D. $\frac{12}{23}$. A. $\frac{3}{18}$. L. lat. 75. L. transv. $\frac{12}{30}$.

The length of the snout is much more than one-half of that of the head. A large triangular black patch covering the neck, the upper surface of the head, and the side downwards to the level of the inferior margin of the eye; a round black spot at the posterior angle of the anal fin; caudal blackish.

From Isle de France to Polynesia.

a. Adult. Amboyna. Purchased of Mr. Frank.
b. Adult: stuffed. Purchased.
c. Adult: not good state. Old Collection.

4. **Chelmo pelta.**

D. $\frac{13}{19}$. A. $\frac{3}{15}$. L. lat. 40. L. transv. 8/19.

The length of the snout is not quite one-half that of the head. Uniform reddish-brown, blackish on the spinous dorsal, a darker band from the origin of the dorsal to the eye.

Hab. ——?

a. From the Collection of the Zoological Society.

Description of the specimen.—The height of the body is one-half of the total length, the length of the head one-third. The upper profile descends abruptly from the origin of the dorsal fin, and is concave. The snout is relatively shorter than in *Ch. rostratus*, forming not quite one-half of the length of the head. The width between the eyes is less than the length of their diameter. The præoperculum has the angle rounded and minutely serrated. The dorsal spines are very strong and long, with the membrane between deeply notched; they increase in length to the fourth, which is $1\frac{1}{2}$ in the length of the head; the following spines gradually become shorter to the last, which is rather shorter than the first ray. The basal half only of the soft dorsal is covered with scales; it is not elevated, and has the upper margin nearly entirely vertically situated. The caudal is truncated. The second anal spine is stronger, but scarcely longer than the third, and $1\frac{1}{2}$ in the length of the head. The soft portion of the anal is much higher than the corresponding part of the opposite fin, and covered with scales on the basal half only. The ventral fins reach to the origin of the anal; the pectorals do not extend to the vertical from the vent. The scales are of moderate size, *ctenoid*; one of the largest covers one-fifth of the eye.

The colour is now uniform reddish-brown, with shining longitudinal streaks, following the series of the scales. The spinous dorsal and its base are blackish. A dark ocular band, much narrower than the orbit, descends from the origin of the dorsal to the eye, and is not continued on the cheek. The soft dorsal has a light posterior margin. The other fins are yellowish or colourless.

	inches.	lines.
Total length	3	4
Height of the body	1	8
Length of the head	1	1
Distance between the anterior margin of the eye and the extremity of the snout	0	$6\frac{1}{3}$
Diameter of the eye	0	$3\frac{1}{3}$
Length of the fourth dorsal spine	0	9
——— of the second anal spine	0	$8\frac{1}{2}$

3. HENIOCHUS*

Heniochus, *Cuv. & Val.* vii. p. 92.
Taurichthys, *Cuv. & Val.* vii. p. 146.

Body much compressed and elevated. One dorsal, with eleven to thirteen spines, the fourth of which is more or less elongate and filiform. Muzzle rather short or of moderate length. No teeth on the palate; præoperculum without spine. Scales of moderate size. Air-bladder present; five branchiostegals; pyloric appendages in small number.

From the Mauritius through all the East Indian Seas to Polynesia and the N.W. coast of Australia.

1. Heniochus macrolepidotus

Renard, i. 3. 13. 31. 168, ii. 14. 66; *Ruysch*, i. no. 3; *Valent.* iii. figs. 18. 201. 324. 372. 509; *Seba*, iii. 25. 8.
Chætodon macrolepidotus, *Artedi, Species*, p. 94; *L. Syst.* i. p. 464; *L. Gm.* p. 1247; *Bl.* tab. 200. f. 1; *Lacép.* iv. p. 455. pl. 11. f. 3 and pl. 12. f. 1; *Bl. Schn.* p. 231.
—— acuminatus, *L. Mus. Ad. Fried.* tab. 33. f. 3.
—— bifasciatus, *Shaw, Zool.* iv. p. 342; *Gronov. Syst. ed. Gray*, p. 75.
Heniochus acuminatus, *Cuv. & Val.* vii. p. 98.
—— permutatus, (*Bennett*) *Cuv. & Val.* vii. p. 99.
—— macrolepidotus, *Cuv. & Val.* vii. p. 93; *Faun. Japon. Poiss.* p. 82. pl. 44. f. 1 (young); *Richards. Ichth. Chin.* p. 246; *Bleeker, Verh. Bat. Gen.* xxiii. *Chætod.* p. 21.
Diphreutes macrolepidotus, *Cant. Catal.* p. 159.

D. $\frac{11}{24}$. A. $\frac{3}{17}$. L. lat. 48. L. transv. 10/22. Cæc. pylor. 6. Vert. 10/14.

The fourth dorsal spine exceedingly elongate, filiform. A small protuberance above each orbit, none on the neck. The upper surface of the snout and a band between the orbits black. Body with two broad black bands: the anterior from the first four dorsal spines, touching the hind margin of the operculum, across the root of the pectorals to the belly, including the ventrals, which are deep black. The posterior band from the fifth, sixth and seventh dorsal spines descending obliquely backwards, and occupying the posterior half of the anal fin; the anterior half is black-edged.

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* 1. *Ruysch*, tab. 20. f. 5; *Renard*, ii. 10. 49; *Valent.* no. 161.—Taurichthys viridis, *Cuv. & Val.* vii. p. 151.—East Indies.

From the Mauritius through all the East Indian Seas to the N.W. coast of Australia.

a. Large specimen: skin: not good state. Ceylon. From Dr. E. F. Kelaart's Collection.
b, c. Fine specimens. Amboyna. Purchased of Mr. Frank.
d. Adult: skin. Port Essington. From Mr. Macgillivray's Collection.
e. Half-grown: not good state. Australia.
f. Adult. Purchased of Mr. Frank.
g. Large specimen. Purchased of Mr. Frank.
h. Adult. From the Haslar Collection.
i. Adult. From the Haslar Collection.
k–m. Adult. From the Collection of the Zoological Society.
n. Adult: skeleton. From the Collection of the Zoological Society.
o. Adult: skeleton. From Dr. A. Günther's Collection.
p. Half-grown: bad state: stuffed.
q. Young: bad state. From the Haslar Collection.

Skeleton.—The structure of the jaw-bones appears to be very similar to that in *Chætodon*. The limbs of the præoperculum are very indistinctly denticulated, and form together a somewhat obtuse angle; the interior ridge is slightly elevated, and has a distinct muciferous channel posteriorly. The operculum is irregularly quadrangular, 2½ as high as wide. The præorbital is oblong, the remainder of the infraorbital ring very narrow, and not joined to the præoperculum; the turbinal tubiform, of moderate length. The anterior frontal bones are rather small. Each principal frontal has an obtuse longitudinal ridge, exteriorly with a small groove; there is another larger cavity between the two ridges. The crown of the skull is elevated, with a high and broad occipital crest, which, however, does not reach to the spurious interneural spines. There are two other crests on the side of the crown, on the inner of which is suspended the suprascapula, the outer one being transformed into a muciferous channel. The humeral is well developed and sword-shaped: the radius and the coracoid form a very deep cavity. The pubic bones are separated from each other by a narrow interspace, and each is composed of four lamellæ.

There are ten* abdominal and fourteen caudal *vertebræ*, the first being much compressed in its longitudinal diameter, so as to be easily overlooked. The greater portion of the three anterior hæmal spines are anchylosed together: the interhæmals of the first two anal spines form one bone only, with a broad triangular process anteriorly; the bone itself is very long, its length being equal to that of the first twelve vertebræ together.

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* Cuvier states eight only.

2. Heniochus monoceros.

Cuv. & Val. vii. p. 100. pl. 176; *Bleek. Verh. Batav. Genootsch.* xxiii. *Chætod.* p. 21.

D. $\frac{12}{26}$. A. $\frac{3}{19}$. L. lat. 58. L. transv. 9/24.

The fourth dorsal spine exceedingly elongate, filiform. A conical protuberance above each orbit, another on the nape of the neck. A black band from the first two dorsal spines, occupying all the neck, the eye, the forehead and the snout; a second band from the fifth, sixth and seventh dorsal spines to the belly, including the root of the pectorals and the ventrals, which are of a deep black; a third band from the posterior dorsal spines, descending obliquely backwards and occupying the posterior half of the anal fin; the anterior half is black-edged.

Sea of the Mauritius.

a. Large specimen. Mauritius. From the Collection of the Zoological Society.

3. Heniochus chrysostoma.

? Heniochus chrysostomus, (*Parkins.*) *Cuv. & Val.* vii. p. 99; *Cuv. Règne Anim. Ill. Poiss.* pl. 40. f. 2.
Heniochus chrysostomus, (*Solander*) *Voy. Beech. Zool.* p. 62. pl. 18. f. 1.
—— melanistion, *Bleeker, Banda,* iii. p. 98.

D. $\frac{12-13}{22}$. A. $\frac{3}{18}$. L. lat. 45. L. transv. 7/25.

The fourth dorsal spine exceedingly elongate, filiform, with a broad floating membrane reaching to its top. A very slight protuberance above the orbit, none on the neck. A black band from the origin of the spinous dorsal to the belly, occupying the whole operculum, the upper portion of the præoperculum, the eye, the root of the pectorals, and the ventrals, which latter are entirely black; a second band from the third to the sixth dorsal spines, descending obliquely backwards and occupying more than the posterior half of the anal; a third broad band along the base of the soft dorsal, extending to the back of the tail and the root of the caudal fin.

East Indian Archipelago. (Otaheite?)

a, b. Fine specimens. Amboyna. Purchased of Mr. Frank.

4. Heniochus varius.

Ruysch, Pisc. Amb. tab. 20. f. 6; *Renard,* i. 30. 164; *Valent.* iii. p. 369. f. 71.
Taurichthys varius, *Cuv. & Val.* vii. p. 148. pl. 181; *Cuv. Règne Anim. Ill. Poiss.* pl. 41. f. 2; *Bleek. Verh. Bat. Gen.* xxiii. *Chætod.* p. 25.

D. $\frac{11}{23}$. A. $\frac{2}{17}$. L. lat. 53.

The fourth dorsal spine elongate. A protuberance above each orbit, conical and horn-like in adult specimens, scarcely visible in younger ones; a third, obtusely conical, on the nape of the neck. A black band from the origin of the dorsal, occupying the whole head to the præopercular margins; the second black band nearly entirely suppressing the ground colour, from the third to the seventh dorsal spines to the belly, and extending from the root of the pectorals and ventrals to the end of the anal, which, like the ventrals, is entirely black.

Molucca Sea.

a. Adult. Molucca Sea.
b. Half-grown. Amboyna. Purchased of Mr. Frank.
c. Very fine specimen. Amboyna. Purchased of Mr. Frank.

4. HOLACANTHUS*.

Holacanthus, *Lacép.* iv. p. 525; *Cuv. & Val.* vii. p. 153.

Body compressed, and generally much elevated. Præoperculum with a strong spine at the angle. One dorsal, entirely scaly, with twelve to fifteen spines; the anal with three (exceptionally with four). No teeth on the palate. Scales of moderate or small size. Six branchiostegals; air-bladder with two posterior horns; pyloric appendages in increased number.

Inhabitants of nearly all the tropical seas.

The species may be grouped together as follows:—

I. Species with scales of moderate size.
  A. With longitudinal bands, p. 42.
  B. Trunk with a whitish vertical blotch or band, p. 45.
  C. Body ornamented by several cross-bands, p. 46.
  D. Body uniform or bicoloured, or merely spotted, p. 49.

II. Species with small scales.
  A. Body with longitudinal bands, p. 52.
  B. Body with white or bluish transverse lines, alternately broader and narrower, p. 52.
  C. Body without bands, p. 54.

I. Species with the scales of moderate size.

A. With longitudinal bands.

1. Holacanthus annularis.

Chætodon annularis, *Bl.* tab. 215. f. 2; *L. Gm.* p. 1262; *Bl. Schn.* p. 219; *Shaw, Zool.* iv. p. 330. pl. 47.
Holacanthus annularis, *Lacép.* iv. pp. 526, 533; *Cuv. & Val.* vii. p. 178; *Cant. Catal.* p. 164; *Bleek. Verh. Bat. Gen.* xxiii. *Chætod.* p. 26.

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* 1. Holacanthus mokhella, (*Ehrenb.*) *Cuv. & Val.* vii. p. 177.—Red Sea.
2. —— flavissimus, *Cuv. & Val.* vii. p. 197.—Island of Ulea.
3. —— luteolus, (*Parkins.*) *Cuv. & Val.* vii. p. 198. Otaheite.

Russell, i. pl. 88.
Chætodon resimus, *Gronov. Syst. ed. Gray*, p. 71.

D. $\frac{13}{20}$. A. $\frac{3}{19}$. L. lat. 66.

The præopercular spine is rather flat, and reaches to the vertical from the posterior margin of the operculum. The dorsal is produced in adult specimens. Head with two bluish streaks from the operculum round the forehead, one through, the other below the eye; shoulder with a blue ring; body with six or seven arched blue streaks, radiating from the base of the pectoral; caudal yellowish.

East Indian Seas.

a. Twelve inches long: skin. Ceylon. Presented by E. F. Kelaart, M.D.
b. Adult: stuffed. Moluccas. Purchased of Mr. Frank.
c. Eleven inches long: stuffed: bad state. From the Collection of the Zoological Society.
d. Adult.
e. Adult: discoloured.
f. Adult: bad state. From the Haslar Collection.
g. Adult: skin. From Gronov's Collection.

2. Holacanthus pseudannularis.

Bleeker, Natuurk. Tydschr. Nederl. Ind. 1858, p. 170.

D. $\frac{13}{22}$. A. $\frac{3}{21}$. L. lat. 60.

The height of the body is about one-half of the total length. Head and body with curved, blue, longitudinal and transverse bands: a single streak along the middle of the forehead; the second from the anterior angle of the branchial aperture before the eye to the vertex; the third from the inferior margin of the præoperculum across its middle to above the eye; the fourth from the ventral spine near the præopercular margin to the nape of the neck; the fifth from the base of the ventral before that of the pectoral to the third dorsal spine; the sixth from the vent behind the shoulder towards the top of the soft dorsal. Head with two longitudinal bands besides, the lower of which is below the eye; the scapular region with a blue ring. Body with five oblique longitudinal bands, broader than those described; tail with a blue cross-bar posteriorly. Anal with two or three curved longitudinal bands; pectoral with two transverse bands at the base; caudal with a violet margin. (*Bl.*)

Sea of Batavia.

3. Holacanthus arcuatus.

Gray, Zool. Miscell. p. 33, and *Griff. Anim. Kingd. Fishes*, p. 325. pl. 1

D. $\frac{13}{18}$. A. $\frac{3}{18}$. L. lat. 48. L. transv. 8/26.

The præopercular spine is conical, and reaches to the vertical from the posterior margin of the operculum; dorsal and anal fins even. A dark brown longitudinal band, slightly arched, from the eye to the posterior margin of the dorsal; the angles of the caudal and a broad margin of the anal brown; the bands and spots yellow-edged.

Sandwich Islands.

a. Adult: stuffed. Sandwich Islands.—Type of the species.

4. Holacanthus lamarckii.

Ruysch, Theatr. Anim. i. *Pisc. Amboin.* p. 29. t. 15. f. 4, 5; *Renard,* i. pl. 26. f. 144, 145; *Valent.* iii. p. 375. nos. 84, 85.

Holacanthus lamarckii, *Lacép.* iv. pp. 526, 532; *Cuv. & Val.* vii. p. 198. pl. 184; *Bleeker, Banda,* iii. p. 100.

D. $\frac{15}{16}$. A. $\frac{3}{18}$. L. lat. 50.

Body and fins not elevated. The præopercular spine with several points at the lower side of its base; the dorsal and anal fins angular posteriorly, the caudal with the lobes produced into filaments. A yellow spot on the neck, before the dorsal fin; body with three or four blackish longitudinal bands; caudal and anal fins spotted with black.

Sea of Banda Neira. (*Bleek.*)

5. Holacanthus caudovittatus.

D. $\frac{15}{16}$. A. $\frac{3}{18}$. L. lat. 45.

Body and fins not elevated. The lower præopercular margin with several small teeth; the dorsal and anal fins angular posteriorly; caudal with the lobes produced. Coloration uniform greyish-red in a dried state; tail and caudal with a black band along the upper and lower margins, the upper one continued along the base of the soft dorsal.

Mauritius.

a. Adult: stuffed. Mauritius. From Dr. Janvier's Collection.

Description of the specimen.—This fish is much more elongate than most of the species of this genus, and resembles *Hol. lamarckii*, the height of the body being $2\frac{1}{4}$ in the total length, without caudal, and $3\frac{1}{8}$ if that fin is included. The upper and lower profiles converge anteriorly in the same curve. The snout is very short, and equals in length the diameter of the eye, or the distance between the eyes. The præorbital has some very fine denticulations inferiorly. The posterior margin of the præoperculum is finely serrated, the lower has some teeth pointing backwards; the spine is flat, smooth, and reaches to the base of the pectoral. The dorsal fin begins in the vertical from the base of the ventral, and has rather feeble spines: the first is the shortest; the following increase very slightly in length to the last two, which are the longest and two-thirds the length of the head: the posterior upper angle of the fin is formed by the eighth and ninth rays, which are the longest. The caudal is forked, both the lobes being produced. The anal begins in the vertical from the twelfth dorsal spine, with three rather feeble spines, the posterior of which is the longest; the soft portion is longer and higher than the corresponding part of the opposite fin. The ventral reaches to, the pectoral nearly to the vent.

The scales are of moderate size, striated, not mixed with smaller ones.

The colour is now a uniform reddish-grey, darker on the back; a black band along the base of the soft dorsal is continued over the back of the tail and the upper caudal lobe; another begins at the lower side of the tail, before the root of the caudal, and is continued over the lower lobe.

	inches.	lines.
Total length	6	3
——— ——— without caudal	4	6
Height of the body	2	0
Length of the head	1	1
——— of the fifteenth dorsal spine	0	8

B. Trunk with a whitish vertical blotch or band.

6. Holacanthus asfur.

Chætodon asfur, *Forsk.* p. 61; *Bl. Schn.* p. 219.
Pomacanthus asfur, *Lacép.* iv. pp. 518, 521, 524.
Holacanthus asfur, *Rüpp. Atl. Fische*, p. 132. taf. 34. f. 2; *Cuv. & Val.* vii. p. 174.

D. $\frac{12}{20}$. A. $\frac{3}{19}$. L. lat. 52. Cæc. pylor. 22.

The præopercular spine is smooth, and reaches to the root of the pectoral; the soft dorsal and anal are much produced. Black: a broad vertical band from the posterior half of the spinous dorsal, and the caudal yellowish.

Red Sea.

a. Adult. Red Sea. From the Senckenberg Museum.

7. Holacanthus maculosus.

Chætodon maculosus, *Forsk.* p. 62; *Bl. Schn.* p. 220.
——— asfur, var. *b*, *Forsk.* p. 61.
Holacanthus aruset, *Lacép.* iv. pp. 528, 537.
——— cœrulescens, *Rüpp. Atl. Fische*, p. 133.
——— lineatus, *Rüpp. l. c.*, and *N. W. Fische*, pp. 31, 32, 36.
——— haddaja, *Cuv. & Val.* vii. p. 175.
——— maculosus, *Cuv. & Val.* vii. p. 176.

D. $\frac{12-13}{21-22}$. A. $\frac{3}{19-21}$. Cæc. pylor. 22.

The scales are very narrow and irregularly arranged; the præopercular spine is smooth, and reaches to the vertical from the posterior margin of the operculum; the dorsal and anal are much produced. Dark brown or brownish-grey, with a lighter vertical band from the posterior half of the spinous dorsal; the anterior part of the body with black semilunar spots; caudal yellowish.

Red Sea.

a. Adult: stuffed. Red Sea. From the Senckenberg Museum.
b. Half-grown. Red Sea.

8. **Holacanthus leucopleura.**

Bleeker, Solor, p. 79.

D. $\frac{14}{16}$. A. $\frac{3}{17}$. L. lat. 44–46. L. transv. 7/22.

The præopercular spine is smooth, and reaches to the base of the pectoral, with two or three small teeth before its base; the dorsal and anal fins are angular posteriorly. Black: back with a large white blotch beneath the tenth and eleventh dorsal spines; ventral posteriorly yellow; anal broadly edged with white.

Seas of Lawajong (Solor) and Amboyna.

This species appears to be closely allied to, if not identical with, *Holacanthus tibicen*, superficially described by Cuvier.

a, b. Fine specimens. Amboyna. Purchased of Mr. Frank.

9. **Holacanthus tibicen.**

Cuv. & Val. vii. p. 173.

D. $\frac{14}{16}$. A. $\frac{4}{16}$.

The præopercular spine reaches nearly to the base of the pectoral, and is armed inferiorly with three small points. Brown, with a large pale blotch on the shoulder, and another vertical and elliptical one on the middle of the back, in the upper half. (*Cuv.*)

Hab. ——?

Typical specimen in the Leyden Museum

10. **Holacanthus passer.**

Valenc. in Voy. Vénus, p. 327. pl. 6.

D. $\frac{14}{18}$. A. $\frac{3}{18}$. L. lat. 75–80.

The præopercular spine is grooved, and reaches to the base of the pectoral; the dorsal and anal fins are produced into a point. Brown, with a white transverse band from the sixth dorsal spine; caudal, ventral, pectoral, and the margins of the dorsal and anal fins yellow. (*Val.*)

Galapagos Archipelago (?).

C. Body ornamented by several cross-bands.

11. **Holacanthus ciliaris.**

Willughby, tab. O. 3. f. 1; ? *Catesby*, ii. pl. 31.
Isabelita, *Parra*, pl. 7. f. 1.
Chætodon ciliaris, *L. Mus. Ad. Fried.* tab. 33. f. 1; *L. Gm.* i. p. 1252; *Bl.* taf. 214; *Bl. Schn.* p. 218.
Chætodon, sp., *Gronov. Zoophyl.* no. 231.
—— parræ, *Bl. Schn.* p. 235.
—— squamulosus, *Shaw, Nat. Misc.* p. 275.
Holacanthus ciliaris, *Lacép.* iv. pp. 527, 534; *Cuv. & Val.* vii. p. 154.
Chætodon aculeatus, *Gronov. Syst. ed. Gray*, p. 72.

D. $\frac{14}{20}$. A. $\frac{3}{20}$. L. lat. 50. L. transv. 8/30.

The præopercular spine is grooved, and does not quite reach to the vertical from the posterior margin of the operculum; the soft dorsal and anal fins are much produced. A bluish ring on the nape of the neck; a bluish blotch on the upper and posterior angle of the operculum; a bluish vertical streak from the occiput, touching the anterior margin of the eye; the dorsal and anal fins with bluish margins; caudal yellow.

Atlantic coasts of Tropical America.

a, b. Adult and half-grown: stuffed. Bahia.
c–f. Adult: skins. Jamaica. From Dr. Parnell's Collection.
g. Adult: skin. West Indies. Purchased of Mr. Scrivener.
h–k. Adult: stuffed. West Indies.
l. Sixteen inches long: stuffed. West Indies.
m, n. Half-grown: stuffed. Old Collection.
o–q. Adult and half-grown: bad state. From the Haslar Collection.
r, s. Adult and half-grown: skins. From Gronov's Collection.
t. Half-grown.
u. Half-grown. From the Haslar Collection.—A bluish vertical streak before and behind the eye, both united by cross-streaks above the orbit.

12. Holacanthus formosus.

Castelnau, Anim. nouv. ou rares de l'Amér. du Sud, Poiss. p. 19. pl. 11. f. 2.

$$D. \frac{14}{25\,(?)}. \quad A. \frac{3}{21\,(?)}.^{*}$$

The præopercular spine is rather small; the scales of moderate size; the dorsal and anal fins produced posteriorly. A blackish ocular band, edged with blue, from the neck to the root of the ventrals; body with four blue transverse bands, one from the middle of the spinous dorsal, the three others from the soft; caudal, ventral, and pectoral fins yellow, the latter with a blackish spot at the base. (*Casteln.*)

Sea of Bahia.

13. Holacanthus lepidolepis.

Bleeker, Batav. p. 468.

$$D. \frac{13}{22}. \quad A. \frac{3}{21}. \quad L.\ lat.\ 70.$$

[The scales are covered with smaller scales at the base.] The præopercular spine is longer than the eye, its length being one-third of that of the head; the dorsal and anal fins are much produced. Each scale with a bluish spot; the opercles and ventral fins edged with blue; the produced parts of the dorsal and anal yellow. (*Bl.*)

Sea of Batavia.

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* The numbers of the fins are entirely wrong as stated by Castelnau, *l. c.*

14. Holacanthus diacanthus.

Renard, i. pl. 14. f. 81, ii. pl. 38. f. 169; *Valent.* iii. p. 474. f. 405, p. 504. f. 507.

Chætodon diacanthus, *Boddært, Epist. ad Gaub. de Chæt. diac.* 1772, and *Schrift. Gesellsch. Naturf. Freunde*, iii. p. 459; *Bl. Schn.* p. 220.

Chætodon dux et boddærtii, *Gm. L.* pp. 1255, 1243.

—— fasciatus, *Bloch*, t. 195; *Gm. L.* p. 1266; *Bl. Schn.* p. 217.

Holacanthus dux, *Lacép.* iv. p. 534; *Cuv. & Val.* vii. p. 184; *Rüpp. N. W. Fische*, p. 37; *Bleek. Celeb.* iii. p. 757.

Acanthopus boddærtii, *Lacép.* iv. pp. 559, 560.

D. $\frac{14 (15)}{19 (17)}$. A. $\frac{3}{19}$. L. lat. 50.

The præopercular spine reaches to the base of the pectoral. Body yellow, with about eight bluish vertical bands, each broadly edged with brown, continued on the dorsal; anal with bluish streaks, running parallel to its base; caudal yellow.

Indian Ocean and Archipelago.

a. Adult: stuffed. Mauritius. From Dr. Janvier's Collection.
b. Adult. Java.
c. Fine specimen. Amboyna. Purchased of Mr. Frank.
d. Adult. Ceram. Purchased of Mr. Frank as *Holacanthus forsteri* (?).

15. Holacanthus melanospilos.

Bleeker, Act. Soc. Sci. Indo-Nederl. ii. *Amboina*, p. 56.

D. $\frac{15}{17}$. A. $\frac{3}{19}$. L. lat. 50.

The præopercular spine is much longer than the diameter of the eye; the dorsal and anal fins are produced to a point; caudal with the lobes much produced. Body with eighteen or nineteen narrow cross-bars; thorax with a large round black, white-edged spot; the vertical fins with small white rings. (*Bl.*)

Sea of Amboyna.

16. Holacanthus bispinosus.

Holacanthus diacanthus, *Bleek. Act. Soc. Sci. Indo-Nederl.* ii. *Amboina*, p. 57 (not *Boddært, Gthr.*).

D. $\frac{14\text{–}15}{17\text{–}16}$. A. $\frac{3}{18\text{–}19}$. L. lat. 45.

Præoperculum with two spines at the angle, the upper of which is the longest, reaching to the base of the pectoral; the dorsal and anal are angular posteriorly. Red: head and neck brown; body with many brown cross-streaks, descending obliquely forwards; the vertical fins brownish-violet, edged with blue and black. (*Bl.*)

Sea of Amboyna.

17. Holacanthus sexstriatus.

Holacanthus sexstriatus, *(Kuhl & v. Hass.) Cuv. & Val.* vii. p. 194: *Bleek. Verhand. Batav. Genootsch.* xxiii. *Chætod.* p. 25.
Chætodon vorticosus, *Gronov. Syst. ed. Gray*, p. 74.

D. $\frac{13}{18-19}$. A. $\frac{3}{18}$. L. lat. 48. L. transv. 7/25.

The præopercular spine is smooth, and reaches to the base of the pectoral; the dorsal and anal fins are not produced. Head and ventral fins brown, the former with a white vertical band, descending from the nape of the neck, between the eye and the præopercular margin, to the spine. Body with six brown vertical bands; each scale of the body with the centre darker.

Molucca Sea.

a, b. Adult. From the Haslar Collection.
c. Adult: stuffed. Old Collection.
d. Adult: skin. From Gronov's Collection.

18. Holacanthus navarchus.

Renard, i. pl. 16. f. 92, ii. pl. 4. f. 17; *Valent.* iii. p. 364. no. 58, p. 367. no. 64; *Ruysch, Theatr. Anim.* i. *Pisc. Amb.* pp. 29, 30. t. 15. f. 10, 11.
Holacanthus navarchus, *Cuv. & Val.* vii. p. 171; *Bleek. Banda,* iii. p. 100.

D. $\frac{14}{18}$. A. $\frac{3}{18}$. L. lat. 50. L. transv. 6/23.

The præopercular spine is grooved, and reaches beyond the vertical from the posterior margin of the operculum; the dorsal and anal fins are rounded posteriorly. A bluish streak from the forehead, below the eye and the root of the pectoral, to the belly, another from the fifth dorsal spine to behind the pectoral; the space between these two streaks bluish-black: the tail, between the posterior half of the soft dorsal and between the anal, and the latter fin black, dotted and margined with blue; the remainder of the body yellow, each scale with a black spot in the centre; pectoral and ventral black; dorsal and caudal yellow, edged with black.

Seas of Amboyna and Banda.

a, b. Fine specimens. Amboyna. Purchased of Mr. Frank.

D. Body uniform or bicoloured, or merely spotted.

19. Holacanthus tricolor.

Edwards, pl. 283. f. 4; *Duhamel, Pêches,* ii. sect. 4. pl. 13. f. 1; *Parra,* pl. 7. f. 2.
Chætodon tricolor, *Bloch,* taf. 425; *Bl. Schn.* p. 219.
Holacanthus tricolor, *Lacép.* iv. pp. 525, 530; *Cuv. & Val.* vii. p. 162; *Cuv. Règne Anim. Ill. Poiss.* pl. 41. f. 3.

D. $\frac{14}{19}$. A. $\frac{3}{18}$. L. lat. 48. L. transv. 8/25. Cæc. pylor. 23. Vert. 24.

The præopercular spine is grooved, and reaches to the vertical from the posterior margin of the operculum; the soft dorsal and anal and the upper caudal ray moderately produced. Head, anterior part of the trunk, caudal, and the margins of the soft dorsal and anal fins yellow, the remainder brownish-black.

Atlantic coasts of Tropical America.

a, b. Adult: stuffed. Bahia.
c. Adult: skin. Trinidad. Presented by J. B. Richardson, Esq.
d–k. Adult: skins. Jamaica. From Dr. Parnell's Collection.
l. Adult. West Indies. Purchased of Mr. Scrivener.
m. Adult. West Indies.
n. Young. West Indies. From the Collection of the Zoological Society.
o. Adult: bad state. From the Haslar Collection.
p. Adult. From the Haslar Collection.
q. Adult: stuffed.

20. Holacanthus bicolor.

Renard, i. pl. 19. f. 106.
Chætodon bicolor, *Bl.* t. 206. f. 1; *Bl. Schn.* p. 218.
Holacanthus bicolor, *Cuv. & Val.* vii. p. 168; *Bleek. Solor*, p. 77.

D. $\frac{15}{16}$. A. $\frac{3}{18}$. L. lat. 48. L. transv. 6/19.

The præopercular spine is conical, and reaches to the root of the pectoral; the dorsal and anal fins with the angle pointed. The anterior portion of the body to the vertical from the sixth dorsal spine, and the caudal yellowish; the remainder of the body deep black. The black and yellowish colours are separated from each other by a streak of a more intense yellow. A broad black ocular band, broader than the orbit, deep black above the orbit, brownish below, not extending over the chest.

East Indian Archipelago.

a. Adult. Purchased of Mr. Frank.

21. Holacanthus trimaculatus.

Holacanthus trimaculatus, (*Lacép.*) *Cuv. & Val.* vii. pp. 196. pl. 182; *Bleeker, Banda*, i. p. 242.

D. $\frac{14}{18}$. A. $\frac{3}{18}$. L. lat. 48. L. transv. 8/26.

The præopercular spine is smooth, and reaches to the base of the pectoral; the dorsal and anal fins not produced. Each scale with a white spot in the centre; lips blackish; a black spot on the nape of the neck, and another edged with white on the shoulder; the lower half of the anal black.

Molucca Sea.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Adult: stuffed. Moluccas.

22. Holacanthus xanthometopon.

Bleeker, Sumatra, ii. p. 258.

D. $\frac{14}{18}$. A. $\frac{3}{18}$. L. lat. 48.

The præopercular spine is more than one-half shorter than the head; the dorsal and anal fins are rounded posteriorly. Head blue; the cheeks and opercles with numerous golden, black-edged dots; chin and lips lineolated with black. A band between the orbits orange-coloured. Body violet; tail yellow: each scale on the sides with a blue spot in the centre and a golden margin; an orange-coloured spot on the scapulary region. Dorsal, caudal, and pectoral fins yellow, edged with violet; the soft dorsal posteriorly with a large round black, blue-edged spot; the anal with numerous blue, black-edged spots. (*Bl.*)

Sea of Sumatra.

23. Holacanthus xanthurus.

Bennett, Proc. Comm. Zool. Soc. 1832, p. 183.

D. $\frac{14}{19}$. A. $\frac{3}{18}$. L. lat. 46. L. transv. 7/22.

The præopercular spine is smooth, and reaches to the base of the pectoral; the dorsal and anal fins rounded posteriorly. Brownish (in spirits), each scale with a light crescent-shaped streak; caudal yellow.

Sea of Ceylon.

a. Fine specimen. Ceylon. Collected by Dr. Sibbald.—Type of the species.

24. Holacanthus vrolikii.

Bleeker, Amboina, iv. p. 339.

D. $\frac{14}{15}$. A. $\frac{3}{16}$. L. lat. 46. L. transv. 6/19.

The præopercular spine is smooth, and reaches to the base of the pectoral; the dorsal and anal fins are rather rounded posteriorly. Uniform greyish-brown, gradually becoming black posteriorly; the margin of the operculum blackish.

Seas of Ceram and Amboyna.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Fine specimen. Ceram. Purchased of Mr. Stevens.

25. Holacanthus nox.

Bleeker, Amboina, iv. p. 338.

D. $\frac{15}{16}$. A. $\frac{3}{18}$. L. lat. 48.

The præopercular spine is about as long as the diameter of the eye; the dorsal and anal fins rounded posteriorly. Black. (*Bl.*)

Sea of Amboyna.

II. Species with small scales.

A. Body with longitudinal bands.

26. Holacanthus septentrionalis.

Temm. & Schleg. Faun. Japon. Poiss. p. 82. pl. 44; *Richardson, Ichth. China*, p. 246.

$D. \frac{13}{18}$. $A. \frac{3}{18}$.

Scales very small. The præopercular spine reaches to the vertical from the posterior margin of the operculum; dorsal and anal fins rounded posteriorly. Head, body, dorsal and anal fins with about twelve blue longitudinal bands: caudal yellow.

Sea of Japan.

a, b. Adult: stuffed.

27. Holacanthus imperator.

Citharædus, *Ælian, Animal.* xi. cap. 23.
Valent. iii. p. 362. f. 51, p. 462. f. 370, p. 479. f. 418; *Ruysch, Coll. Pisc. Amb.* p. 37. tab. 19. f. 1; *Renard*, i. 16. 93, ii. 56. 238.
Chætodon imperator, *Bloch*, iii. p. 51. t. 194; *L. Gm.* p. 1255; *Bl. Schn.* p. 217.
Holacanthus imperator, *Lacép.* iv. pp. 527, 534. pl. 12. f. 3; *Cuv. & Val.* vii. p. 180; *Bleeker, Celebes*, iii. p. 758, and *Act. Soc. Nederland.* i. *Manado en Makassar*, p. 49.

$D. \frac{14}{22}$. $A. \frac{3}{20}$.

Scales small. The præopercular spine reaches to the base of the pectoral. Head, chest, and anal fin with bluish lines. An oblong black spot between the shoulder, the operculum, and the root of the pectoral; body with many orange-coloured, slightly waved streaks; caudal yellow.

Indian Ocean and Archipelago.

a. Fourteen inches long: skin. Ceylon. Collected by E. F. Kelaart, M.D.
b. Adult. Amboyna. Purchased of Mr. Frank.
c. Thirteen inches long.
d. Thirteen inches long: stuffed.

B. Body with white or bluish transverse lines, alternately broader and narrower.

28. Holacanthus nicobariensis.

Renard, i. pl. 5. f. 34.
Chætodon nicobariensis, *Bl. Schn.* p. 219. t. 50.
Holacanthus geometricus, *Lacép.* iv. pp. 528, 537. pl. 13. f. 1; *Cuv. & Val.* vii. p. 189.
—— nicobariensis, *Bleeker, Amboina*, vi. p. 413

$D. \frac{14}{20}$. $A. \frac{3}{19}$.

Scales small. The anal and dorsal fins rounded posteriorly. Black, with curved, concentric, alternately white and bluish transverse lines, the posterior of which forms a complete ring; on the dorsal, caudal and anal fins, the lines are divided and form reticulations; the posterior half of the caudal is white.

East Indian Archipelago.

29. Holacanthus semicirculatus.

Holacanthus semicirculatus, *Cuv. & Val.* vii. p. 191. pl. 183; *Bleek. Amboina,* vi. p. 414 (not *Banka,* p. 452); *Voy. Coqu. Zool. Poiss.* p. 173. pl. 30. f. 3.

Chætodon microlepis, *Bleeker, Sumatra,* ii. p. 257.

D. $\frac{13-14}{21}$. A. $\frac{3}{20}$.

Scales small. The præopercular spine is smooth, and reaches to the vertical from the posterior margin of the operculum; anal and dorsal fins triangular, not produced. Entirely black, with curved, concentric, alternately white and bluish transverse lines, the white ones being broader; caudal black, with white cross-streaks.

East Indian Archipelago; Polynesia.

a. Adult. Feejee Islands. Voyage of the Herald.
b, c. Adult and young. Amboyna. Purchased of Mr. Frank.
d. Adult. From the Collection of the Zoological Society.

30. Holacanthus striatus.

Holacanthus striatus, *Rüppell, N. W. Fische,* p. 32. taf. 10. f. 2; *Bleek. Amboina,* vi. p. 414.

—— semicirculatus, *Bleeker, Banka,* p. 452 (not *Cuv.*).

D. $\frac{12}{23}$. A. $\frac{3}{21}$.

Scales small. The præopercular spine reaches to the vertical from the posterior margin of the operculum. Black, with curved, concentric, alternately white and bluish transverse lines, the white ones being broader; caudal white.

Red Sea.

a. Half-grown. Red Sea.

31. Holacanthus alternans.

Cuv. & Val. vii. p. 193.

D. $\frac{13}{21}$. A. $\frac{3}{19}$.

Scales small. Dorsal produced into a long point; anal angular. Brown, dotted with darker anteriorly, with lighter posteriorly and on the dorsal and anal fins; four white vertical lines on the side of the head; body with curved white transverse lines, alternately broader and narrower, those on the tail vertical and straight; caudal with one or two white transverse lines. (*Cuv.*)

Sea of Madagascar.

32. Holacanthus chrysurus.

Cuv. & Val. vii. p. 188.

D. $\frac{13}{19}$. A. $\frac{3}{19}$.

Dorsal fin slightly pointed. Brown: a bluish line from the neck round the eye towards the mouth, emitting three other lines to the margin of the interoperculum; a vertical line on the operculum, extending before the pectoral to the base of the ventral; a third on the chest; body with six whitish curved lines, alternately broader and narrower, extending over the dorsal and anal; there are several other indistinct lines in the interspaces between those described; caudal yellow, with a fine black marginal line. (*Cuv.*)

Hab. —— ?

33. Holacanthus cæruleus.

Holacanthus cæruleus, (*Ehrenbg.*) *Cuv. & Val.* vii. p. 194.

D. $\frac{12}{15}$. A. $\frac{3}{15}$.

Blue, with curved white transverse lines, alternately broader and narrower; caudal yellow; dorsal and anal fins rounded. (*Cuv.*)

Red Sea.

C. Body without bands.

34. Holacanthus mesoleucus.

Renard, i. 22, 121; *Valent.* iii. p. 361. f. 48.
Chætodon mesoleucus, *Bl.* tab. 216. f. 2; *Bl. Schn.* p. 227.
—— mesomelas, *Gm.* i. p. 1263.
Holacanthus mesoleucus, *Lacép.* iv. pp. 528, 537; *Cuv. & Val.* vii. p. 170; *Bleek. Verh. Batav. Genootsch.* xxiii. *Chætod.* p. 26.
Chætodon atratus, *Gronov. Syst. ed. Gray,* p. 72.

D. $\frac{12}{17}$. A. $\frac{3}{17}$.

Scales small. The præopercular spine not grooved, reaching to the vertical from the posterior margin of the operculum; dorsal and anal fins rounded posteriorly. Head with the anterior part of the body yellow, which colour passes gradually into brown; a broad brown ocular band from the neck, across the chest; the brown part of the body finely reticulated with white; caudal white.

East Indian Archipelago.

a. Fine specimen. Macassar. Purchased of Mr. Frank.
b. Adult: bad state. Moluccas. Purchased of Mr. Frank.
c. Adult: skin. From Gronov's Collection.

35. Holacanthus chrysocephalus.

Bleeker, Java, ii. p. 428.

D. $\frac{13}{18}$. A. $\frac{3}{17}$.

Scales small. The præopercular spine is about as long as the eye, the dorsal and anal fins rounded posteriorly. Body yellowish-red anteriorly, and brownish-violet behind the pectoral fins; anteriorly with blue longitudinal bands, posteriorly with numerous blue spots, arranged in longitudinal series; anal with a pair of blue longitudinal bands; caudal yellowish-red. (*Bl.*)

Sea of Batavia.

36. Holacanthus melanosoma.

Bleeker, Solor, p. 78.

D. $\frac{13}{10}$. A. $\frac{3}{18}$. L. lat. 100.

The præopercular spine is about as long as the diameter of the eye; the dorsal and anal fins rounded posteriorly. Black: head anteriorly spotted with yellow; the dorsal and anal fins posteriorly yellow-edged; caudal yellow, with a black transverse spot. (*Bl.*)

Sea of Lawajong (Solor).

5. POMACANTHUS.

Pomacanthus, *Lacép.* iv. p. 517; *Cuv. & Val.* vii. p. 200.

Body compressed and much elevated. Præoperculum with a strong spine at the angle. One dorsal, entirely scaly, with eight to ten spines, the anal with three. No teeth on the palate. Scales rather small. Six branchiostegals; air-bladder present; pyloric appendages in increased number.

Atlantic coasts of Tropical America.

The scales of the fishes of this genus, or rather subgenus, have a great tendency towards irregularity of size and arrangement, as in several species of *Holacanthus*. Smaller and larger scales are mixed together, the former generally predominating in young individuals. Cuvier has established not less than six species for a single one (!).

1. Pomacanthus paru.

Chirivita, *Parra,* pl. 6. f. 1 & 2.
Paru, *Marcgr.* p. 144.
Guaperva, *Marcgr.* p. 178.
Acarauna nigra, *Willughby,* pl. O. 3. f. 4.
Seba, iii. 25. 5 & 6.
Chætodon arcuatus, *L. Mus. Ad. Frid.* pl. 33. f. 5; *Bl.* taf. 201. f. 2; *Bl. Schn.* p. 218.
—— no. 4, *Brown, Jamaica,* p. 454.
—— aureus, *Bloch,* taf. 193. f. 1 (not good); *Bl. Schn.* p. 217.
—— paru, *Bloch,* taf. 197; *Bl. Schn.* p. 217.
Pomacanthus lutescens, *Lacép.* iv. pp. 518, 521, 523.
—— aureus, *Cuv. & Val.* vii. p. 202.
—— paru, *Cuv. & Val.* vii. p. 205.
—— balteatus, *Cuv. & Val.* vii. p. 208.
—— cingulatus, *Cuv. & Val.* vii. p. 209. pl. 185; *Casteln. Anim. nouv. ou rares Amér. du Sud, Poiss.* p. 20.

Pomacanthus quinquecinctus, *Cuv. & Val.* vii. p. 210; *Casteln. l. c.*
—— arcuatus, *Cuv. & Val.* vii. p. 211; *Casteln. l. c.*

D. $\frac{8-10}{30}$. A. $\frac{3}{24}$. Cæc. pylor. 15. Vert. 10/14.

Scales rather irregularly arranged; præopercular spine rather short and flat. The anterior rays of the soft dorsal and anal much produced. Immature specimens with some yellowish vertical bands; adult ones with small white crescent-shaped spots, sometimes irregularly spotted with black.

A. *Adult specimens.*—Ground-colour dark; body with many small white or yellow crescents; base of the pectoral yellow: *Chætodon paru,* Bloch; *Pomacanthus paru,* Cuv.

a, b. Twenty-one inches long: stuffed. West Indies.
c. Stuffed. West Indies.
d. Skin. Jamaica. From Dr. Parnell's Collection.

Variety.—Ground-colour yellowish; body with many irregular brown or black spots: *Chætodon aureus,* Bloch; *Pomacanthus aureus,* Cuv.

e. Eighteen inches long: stuffed. West Indies.
f. Stuffed. America.
g. Skin. Jamaica. From Dr. Parnell's Collection.

B. *Half-grown specimens.*—Ground-colour dark; body with many small white or yellow crescents, and with one, two or three rather indistinct lighter vertical bands: *Pomacanthus cingulatus,* Cuv.

h, i. Skins. From the Collection of the Zoological Society.
k. Skeleton: not in a good state.

Variety.—Ground-colour brownish-yellow; body with many brown spots, and with one, two or three more or less indistinct lighter vertical bands: *Pomacanthus balteatus,* Cuv.

l. Skin. Jamaica. From Dr. Parnell's Collection.

C. *Young specimens with the scales fully developed,* sometimes with smaller scales between the larger ones; body with five distinct yellow cross-bands, and sometimes with white crescents or brown spots; caudal yellow, with a large brown crescent: *Pomacanthus quinquecinctus,* Cuv.

m. Stuffed. Bahia.
n. Puerto Cabello. Purchased of Mr. Brandt.
o. Skin. Jamaica. From Dr. Parnell's Collection.
p–r Stuffed. West Indies.
s. Fine specimen.
t. Discoloured.
u. Stuffed. America.
v. Bad state. America.

D. *Young specimens with small scales,* sometimes with larger ones between the smaller ones. Coloration like the former: *Pomacanthus arcuatus.*

w, x. Skins. Jamaica. From Dr. Parnell's Collection.
y. Stuffed.
z. Purchased of Mr. Frank.

Skeleton.—The structure of the skeleton agrees in the chief points with that of *Chætodon.* The maxillary bone is very short, and may be almost entirely hidden below the præorbital; it is crossed by a long horizontal process arising from the palatine bone. The intermaxillary has the posterior process very elongate, and the descending branch exceedingly short. The articular and dentary of the mandibula are well developed and somewhat oblong. The limbs of the præoperculum form together a nearly right angle, and are not denticulated: the lower limb is one-half the length of the posterior; the interior ridge is very depressed, and there is scarcely a trace of a muciferous channel; the operculum is subquadrangular, with the posterior side slightly concave; the suboperculum is lanceolate; the interoperculum broader anteriorly than posteriorly. The præorbital is oblong, and rather broader than the inferior portion of the suborbital ring, the posterior being firmly attached to the præoperculum; there is a concave plate at the inner side of the suborbitals, to support the eyeball from beneath. The turbinal bones are elongate, and in immediate contact with each other posteriorly, where they are broadest. The anterior frontal bones are small, and overreached by a slight prominence of the principal frontals. The bones of the crown of the skull form one smooth, rounded and very elevated mass, terminating above in an exceedingly high and strong occipital crest, to the upper end of which are joined the processes of two spurious interneural spines. Of the sutures, those between the frontals and the supraoccipital are visible. The suprascapula is entirely united with the bones of the skull; the humeral is strong, sword-shaped. The radius and the coracoid form a broad shallow cavity for the muscles of the pectoral fin; both bones are partly separated from each other by a cleft and by an ovate open space. Each pubic bone is composed of three lamellæ of nearly equal development.

There are ten abdominal and fourteen caudal *vertebræ.* The anterior interneural and neural spines are dilated posteriorly in a transparent lamella. The two anterior hæmals are grown together, but the corresponding interhæmals are free.

6. SCATOPHAGUS*

Scatophagus, *Cuv. & Val.* vii. p. 136.
Cacodoxus, *Cant. Catal.* p. 163

Body much compressed and elevated. Snout of moderate length. Two dorsals, united at the base, the first with ten or eleven spines

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1. Scatophagus purpurascens, *Cuv. & Val.* vii. p. 144.—East Indies.

the second covered with scales; a recumbent spine before the dorsal pointing forwards; anal with four spines; pectorals short. No teeth on the palate; præoperculum without spine. Scales very small. Branchiostegals six; air-bladder simple; pyloric appendages in increased number.

East Indian and Australian Seas, entering rivers.

1. **Scatophagus argus.**

Piscis stercorarius, *Willughby, App.* p. 2. pl. 2. f. 2.
Renard, ii. 50. 211; *Valent.* iii. p. 403. f. 180; *Ruysch, Pisc. Amb.* p. 33. tab. 17. f. 6; *Klein, Miss.* iii. p. 36. no. 4; *Russell,* i. pl. 78.
Stront-visch, *Nieuhof, Braz. Land- und Zee-Reise,* p. 269. pl. 268.
Chætodon argus, *L. Gm.* p. 1248; *Bl.* tab. 204. f. 1; *Bl. Schn.* p. 232; *Shaw, Zool.* iv. p. 332.
—— pairatalis, *Buch. Ham.* pp. 122, 372. pl. 16. f. 41.
Ephippus argus, *Cuv. Règne Anim.*
Chætodon atromaculatus, *Benn. Ceyl. Fish.* pl. 18.
Scatophagus argus, *Cuv. & Val.* vii. p. 136; *Richards. Ichth. Chin.* p. 245; *Bleek. Verh. Batav. Genootsch.* xxiii. *Chætod.* p. 24.
Cacodoxus argus, *Cant. Catal.* p. 163.
Scatophagus macronotus, *Bleek. Topogr. Batav.* (monstr.).
Sargus maculatus, *Gronov. Syst. ed. Gray,* p. 65.

D. $10 \left| \frac{1}{16} \right.$. A. $\frac{4}{14}$. Cæc. pylor. 20. Vert. 11/12 (10/14 *Cuv.*).

The width between the eyes is $2\frac{1}{3}$ in the length of the head; the length of the fourth dorsal spine is $2\frac{1}{2}$ in the height of the body. Præorbital with the lower posterior angle denticulated. Body and vertical fins spotted with brown.

East Indian and Chinese Seas, entering rivers.

a, b. Adult. Singapore.
c. Young. Singapore.
d. Half-grown. Amboyna. Purchased of Mr. Frank.
e, f. Young. Ceram. Purchased of Mr. Stevens.
g. Adult. Malacca. Purchased of Mr. Cuming.
h. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
i, k. Adult. China.
l. Adult. China.
m–p. Adult and half-grown. India. Presented by W. Masters, Esq.
q–v. Half-grown: not good state. India.
w. Young. India.
x. Adult. India. Presented by G. R. Waterhouse, Esq.
y. Adult. From the Haslar Collection.
z. Adult: skin.
α. Adult: skin. Presented by B. H. Hodgson, Esq.
β. Adult: stuffed: not good state. Old Collection.
γ. Adult: skin. From Gronov's Collection.
δ. Adult: skeleton. From the Collection of the Zoological Society.

Skeleton.—The maxillary bone is small, slightly bent; the intermaxillary also is little developed, and has the posterior process much shorter than the descending branch; the mandibula is exceedingly short. The limbs of the præoperculum form together a right angle, the lower one being shorter than the posterior; the interior ridge is scarcely elevated, and there are some irregular openings leading into the muciferous channel. The operculum is irregularly quadrangular, with the two upper sides slightly emarginate; it is not quite twice as high as wide. The sub- and interoperculum are rather elongate, the former tapering posteriorly, the latter anteriorly. The infraorbital bones are very solid, although narrow, and the posterior ones are attached to the præoperculum; there is a very broad plate on their inner side, to support the eyeball from beneath. The anterior frontals are rather small and not projecting; the principal frontals and the other bones of the crown form together one solid, smooth, slightly porous mass, the upper side of the skull appearing very broad and convex; it is continued into the occipital crest, which, however, does not reach to the first dorsal spine. The glossohyal is small, styliform; the urohyal triangular, with a wing-like process on each side.

The suprascapula is firmly joined to the bones of the skull; the scapula oblong; the humeral exceedingly long, rib-like. The exterior lamella of the coracoid is well developed, and as broad as the interior; the radius is slender, and leaves a wide free space on its suture with the coracoid. The pubic bones are in immediate contact with each other; each is composed of three lamellæ, the inferior of which is the most developed.

There are eleven abdominal and twelve caudal *vertebræ**, the length of the former portion of the vertebral column being to that of the caudal as 1·2 : 1 : thus, this fish offers the first example where the abdominal portion is the longest. The centre of the first vertebra is not developed. The neural spines of the abdominal vertebræ are broad and compressed, without a transparent lamella; a great portion of the anterior four hæmals are anchylosed together. There are no spurious interneurals; the first interneural is the strongest, reclined backwards, and superiorly armed with a spine pointing forwards. The first interhæmal is exceedingly strong, and provided inferiorly with a triangular process; the length of this spine equals that of the anterior nine vertebræ together.

2. Scatophagus bougainvillii.

Cuv. & Val. vii. p. 142; ? *Richards. Ichth. Chin.* p. 245.

$$D.\ 10 \left| \frac{1}{16}. \quad A.\ \frac{4}{14}. \right.$$

The length of the fourth dorsal spine is one-fourth of the height of the body. Back with black dots along the base of the dorsal fin. (*Cuv.*)

East Indies?

3. Scatophagus ornatus.

Cuv. & Val. vii. p. 143. pl. 180; *Bleeker, Amboina,* v. p. 492.

$$D.\ 10 \left| \frac{1}{17}. \quad A.\ \frac{4}{15}. \right. \quad \text{Cæc. pylor. } 20.$$

The length of the fourth dorsal spine is 3–$3\frac{1}{3}$ in the height of the body; præorbital denticulated. *Young* individuals with about twelve transverse blackish streaks: *mature* specimens with two red streaks on the head, one from the forehead to the snout, the other from the neck to the eye; body with spots irregularly arranged in cross-series: *old* specimens without red bands; body with spots irregularly disposed; dorsal edged with brown.

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* Cuvier professes to have found ten abdominal and fourteen caudal vertebræ.

Rivers of Amboyna.

4. Scatophagus tetracanthus.

Chætodon tetracanthus, *Lacép.* iv. p. 727, iii. pl. 25. f. 2.
? Chætodon striatus, *Rosenth. Ichthyot. Taf.* taf. 13. f. 2.
Scatophagus fasciatus, *Cuv. & Val.* vii. p. 144.

$$D.\ 10 \mid \tfrac{1}{16}.\quad A.\ \tfrac{4}{14}.$$

Brownish, with five dark vertical bands.

Hab. —— ?

5. Scatophagus multifasciatus.

Richards. Voy. Ereb. & Terr. Fishes, p. 57. pl. 35. f. 4–6.

$$D.\ 11 \mid \tfrac{1}{17}.\quad A.\ \tfrac{4}{16}.$$

The width between the eyes is $2\frac{2}{3}$ in the length of the head; the third dorsal spine is considerably the longest, and its length $2\frac{1}{3}$ in the height of the body. Præorbital with the lower posterior angle minutely serrated. Back with about twelve narrow vertical bands, between which are others still narrower and shorter.

Coasts of Australia.

a. Adult. North Australian Expedition. Presented by Dr. J. R. Elsey.
b. Half-grown. Sydney.
c. Half-grown. Sydney. Presented by Sir J. Richardson.
d. Adult: stuffed. King George's Sound.—Type of the species.
e. Adult: stuffed. Cape York. Voyage of H.M.S. Rattlesnake (caught in 61 fathoms).
f. Adult: stuffed. Purchased of Mr. Warwick.

7. EPHIPPUS*.

Ephippus, *Cuv. Règne Anim.*; *Cuv. & Val.* vii. p. 112.

Body much compressed and elevated. Snout short, with the upper profile parabolic. Dorsal deeply emarginated between the spinous and soft portions, the former with nine (eight) spines, the third (second) of which is rather elongate, flexible; the spinous portion is not scaly, only folding into a groove. Pectorals short; anal spines three. No teeth on the palate; præoperculum without spine. Scales moderate or rather small. Branchiostegals six; air-bladder bifurcate anteriorly, and with two horns posteriorly.

Tropical parts of the Atlantic, spreading northwards along the American coasts to New York; East Indian Seas.

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* 1. Ephippus zonatus, *Girard in U. S. Pacif. R. R. Exped. Fishes,* p. 110.—Coast of California.

1. Ephippus faber.

Faber marinus, *Sloane, Hist. Jam.* ii. p. 251. f. 4.
Chætodon triostegus, part., *L. Syst. Nat.* p. 463; *Gm. L.* p. 1246.
Zeus quadratus, *Gm. L. Syst. Nat.* p. 1225.
Chætodon faber, *Bl.* taf. 212. f. 2; *Bl. Schn.* p. 223; *Gm.* i. p. 1263; *Lacép.* iv. pp. 456, 482; *Shaw, Zool.* iv. p. 340.
Selene quadrangularis, *Lacép.* iv. p. 564.
Chætodon oviformis, *Mitch. Trans. Lit. & Phil. Soc. N. York*, i. pl. 5. f. 4.
Ephippus faber, *Cuv. & Val.* vii. p. 213; *Dekay, New York Fauna, Fishes*, p. 97. pl. 23. f. 68; *Holbr. Ichth. S. Carol.* p. 108. pl. 15. f. 1.

D. $8 \,\big|\, \frac{1}{23}$. A. $\frac{3}{19}$. L. lat. 65. Vert. 9/14. Cæc. pylor. 4.

The third dorsal spine elongate, flexible; the anterior portion of the soft dorsal and anal produced (in adult specimens; rounded in younger ones); the first ray of the ventral fins elongate. Six rather indistinct brownish cross-bands, the anterior of which passes the eye; adult specimens uniform.

Atlantic coasts of the United States and of Tropical America.

a. Adult. Guatemala.
b, *c*. Half-grown. Texas. Purchased of Mr. Brandt.
d. Half-grown: bad state. West Indies. Purchased of Mr. Scrivener.
e. Adult. St. Domingo. Purchased of Mr. Cuming.
f–q. Half-grown: skins. Jamaica. From Dr. Parnell's Collection.
r. Adult. North America. Presented by Edward Doubleday, Esq.
s. Half-grown. N. America. Presented by Edward Doubleday, Esq.
t. Half-grown. N. America. Presented by Edward Doubleday, Esq.
u, *v*. Half-grown: bad state. From the Haslar Collection.
w. Adult: stuffed: not good state.

2. Ephippus gigas.

Ephippus gigas, (*Parkins.*) *Cuv. Règne Anim.*; *Agass. in Spix, Genera et Spec. Pisc. Brasil.* p. 113. tab. 61; *Cuv. & Val.* vii. p. 121. pl. 204; *Dekay, New York Fauna, Fishes*, p. 99. pl. 23. f. 71; *Holbr. Ichth. S. Carol.* p. 105. pl. 15. f. 2.

D. $8 \,\big|\, \frac{1}{21}$. A. $\frac{3}{17}$. Vert. $\frac{10}{14}$. Cæc. pylor. 6.

This species is said to be distinguished from the preceding by the extraordinary development of the occipital crest and of the anterior interhæmals into thick bony masses, which peculiarity is not found in any of the numerous specimens of *Eph. faber* in the British Museum. None of these exceed the length of eight inches; and it will require a renewed examination to decide whether Benjamin Wolf was not right in referring the skeleton, which he described in his dissertation (Berlin, 1824), to *Ephippus faber*.

a. Interhæmal spine.

3. Ephippus goreensis.

Cuv. & Val. vii. p. 125. pl. 178.

D. $7 \,\big|\, \frac{1}{19}$. A. $\frac{3}{15}$. L. lat. 40.

The second dorsal spine elongate, flexible; the soft dorsal and anal not elevated anteriorly; the first ray of the ventral fins elongate. Coloration uniform. (*Cuv.*)

Cape Verde.

4. Ephippus orbis.

Chætodon orbis, *Bl.* tab. 202. f. 2; *Bl. Schn.* p. 232; *Lacép.* iv. pp. 458, 491; *Shaw, Zool.* iv. p. 339.
Ephippus orbis, *Cuv. & Val.* vii. p. 127; *Richards. Ichth. Chin.* p. 245; *Bleeker, Verhand. Batav. Genootsch.* xxiii. *Chætod.* p. 22.
Ilarches orbis, *Cant. Catal.* p. 160.
Ephippus melanopus, *Bleeker, Topogr. Batav.*

D. $\frac{9}{19}$. A. $\frac{3}{15}$. L. lat. 35. L. transv. 7/15.

The third and fourth dorsal spines and the first ventral ray elongate, filiform. Coloration uniform.

East Indian Seas.

a. Adult. Sumatra. Purchased of Mr. Frank.
b. Adult: skin. Ceylon. Collected by E. F. Kelaart, M.D.

8. DREPANE.

Drepane, *Cuv. & Val.* vii. p. 129.

Body much compressed and elevated. Snout short, with the upper profile parabolic. Dorsal deeply emarginate, with eight or nine spines, the third of which is the longest and flexible; the spinous portion of the fin is not scaly, only folding into a groove. Pectorals elongate, falciform; anal spines three. No teeth on the palate; præoperculum without spine. Scales moderate. Branchiostegals six; air-bladder prolonged into two horns posteriorly; pyloric appendages in small number.

East Indian Seas.

1. Drepane punctata.

Chætodon punctatus, *L. Gm.* p. 1243; *Shaw, Zool.* iv. p. 365.
—— longimanus, *Bl. Schn.* p. 231.
—— falcatus, *Lacép.* iv. pp. 452, 470.
Russell, pls. 79, 80, 81.
Ephippus punctatus, *Cuv. Règne Anim.*
—— longimanus, *Cuv. Règne Anim.*
Drepane punctata, *Cuv. & Val.* vii. p. 132. pl. 179; *Richards. Ichth. Chin.* p. 245, and *Ann. & Mag. Nat. Hist.* x. 1842, p. 28.
—— longimana, *Cuv. & Val.* vii. p. 133; *Richards. Ichth. Chin.* p. 245; *Bleek. Verh. Batav. Genootsch.* xxiii. *Chætod.* p. 23.
Harpochirus punctatus, *Cant. Catal.* p. 162.
—— longimanus, *Cant. Catal.* p. 163.

D. $\frac{8}{20}$. A. $\frac{3}{18}$. L. lat. 50. L. transv. 14/33. Cæc. pylor. 2–3.

The third dorsal spine is the longest; the first ray of the ventral fin elongate; the pectoral reaches to, or nearly to the root of the caudal Uniform silvery, or with vertical series of brown specks, which are sometimes confluent.

East Indian Seas; N.W. coast of Australia.

A. Uniform specimens (*Drepane longimanus*).

a. Half-grown. N.W. Australia. From the Haslar Collection.
b. Half-grown. Australian Seas. From Mr. Dring's Collection.
c. Half-grown: not good state. China.
d. Young: not good state. China.
e. Half-grown. India. Presented by General Hardwicke.
f. Half-grown. From the Collection of the Zoological Society.
g. Half-grown: bad state. From the Collection of the Zoological Society.

B. With vertical series of brown specks (*Drepane punctata*).

h. Fine specimen. Philippines. Purchased.
i. Large specimen: skin.

C. With brownish vertical bands.

k. Adult.

9. HYPSINOTUS.

Hypsinotus, *Schleg. Faun. Japon. Poiss.* p. 84

Body much compressed and elevated; snout of moderate extent. Two dorsal fins, separated from each other by a notch: the first with eight spines, the second of which is the longest; the soft dorsal scaly at the base only; anal with three spines; pectorals of moderate extent; ventrals well developed. Teeth very small; scales small; branchiostegals six.

Sea of Japan.

1. Hypsinotus rubescens.

Hypsinotus, *Schleg. l. c.* pl. 42. f. 2.

$$D.\ \frac{8}{27}.\quad A.\ \frac{3}{26}.\quad V.\ 1/5.$$

Red. The height of the body equals its length (without fins).

Sea of Japan.

Second Group. SCORPIDINA.

10. SCORPIS.

Scorpis, *Cuv. & Val.* viii. p. 503. pl. 245.

Body compressed and more or less elevated; snout of moderate length. One dorsal, with nine or ten spines, and with the soft portion covered with scales; the anal scaly, with three spines. Jaws with an outer series of stronger teeth; teeth on the vomer and on the palatine bones. Seven branchiostegals; air-bladder present; pyloric appendages in very great number.

Australian Seas: coast of Chile.

1. Scorpis georgianus.

Cuv. & Val. viii. p. 503. pl. 245

D. $\frac{9}{26}$. A. $\frac{3}{27}$.

The soft dorsal and anal falcate, the anterior rays being elevated. Uniform brownish.

King George's Sound.

a. Adult: skin: not good state. Australia.

2. Scorpis chilensis.

Gay, Hist. Chil. Zool. ii. p. 220; *Ictiol.* lam. 6. f. 1.

D. $\frac{10}{27}$. A. $\frac{3}{25}$.

The posterior and inferior margins of the præoperculum finely serrated; the dorsal and anal fins are not falcate, the rays becoming gradually shorter posteriorly. Coloration uniform. (*Gay.*)

Island of Juan Fernandez.

3. Scorpis æquipinnis.

Richards. Voy. Ereb. & Terr. Fishes, p. 121.

D. $\frac{10}{27}$. A. $\frac{3}{27}$.

The lower margin only of the præoperculum finely serrated. The dorsal and anal fins are not falcate, the rays becoming gradually shorter posteriorly. Coloration uniform.

Coasts of Australia.

a. Adult: skin. Swan River. Voyage of H.M.S. Fly.
b, c. Half-grown: skins. Port Jackson. Purchased of Mr. Gould.
d. Half-grown: skin. Australia. Purchased of Mr. Warwick.
e. Half-grown: skin. King George's Sound.—Type of the species.

11. ATYPUS[*].

Body compressed, oblong; snout rather short; cleft of the mouth small, with the jaws equal. One dorsal with eleven spines, the anal with three; the soft portions only enveloped in scales. Scales rather small, ctenoid. Villiform teeth in the jaws and on the vomer; none on the palatine bones. Præoperculum denticulated. Branchiostegals seven; air-bladder bifurcate anteriorly and posteriorly; pyloric appendages in moderate number.

Coasts of Australia.

1. Atypus strigatus.

B. 7. D. $\frac{11}{15-16}$. A. $\frac{3}{15-16}$. L. lat. 70–75. L. transv. $\frac{11}{26}$. Cæc. pylor. 11.

Body with five or six brown, parallel, longitudinal bands.

a. Adult: skin. Swan River. Voyage of H.M.S. Fly.

[*] From ἄτυπος, without any distinct affinity to a typical form of a family.

b. Adult: skin. Holdfast Bay. Voyage of H.M.S. Fly.
c, *d*. Adult: skins. Australia. Purchased of Mr. Warwick.
e. Fine male specimen. Raoul Island. Presented by the Lords of the Admiralty.

Description.—The fish, upon which I have founded this new genus, has some affinity to several others of different families. It might be referred to the family of the *Percidæ*, if it had not the soft portions of the dorsal and anal entirely covered with scales. In consequence of the presence of teeth on the palate, and of the structure of the air-bladder, we are obliged to remove it from the *Pristipomatidæ*, although it bears a strong resemblance to *Therapon*. For the present, the fish appears to be nearest allied to *Scorpis*, from which, however, it differs generically by the shape of the spinous dorsal.

The general form of the body is that of a species of *Therapon*; it is compressed, oblong, its greatest height below the fifth dorsal spine being one-third of the total length. The upper profile descends obliquely downwards to the end of the snout, in a very slightly curved line. The length of the head is 4½ in the total; the extent of the snout is less than the diameter of the eye or the space between the orbits, which is slightly convex. The cleft of the mouth is small, the upper maxillary reaching to the anterior margin of the orbit. The præorbital is nearly as wide as high, with the lower margin rounded and very slightly serrated. No pores are visible at or between the pieces of the mandibula. The eye is of moderate size. The præoperculum is rather deeply serrated round its margins, the denticulations being longest at the angle, which is a right one. The operculum is not armed. All the head is covered with very small scales.

The *dorsal* fin begins in a vertical drawn from between the bases of the pectoral and ventral fins, and terminates at a distance from the caudal, which equals that between the eye and the posterior margin of the operculum. The upper margin of the fin has no notch between the two portions, and its profile descends gradually from the fifth spine to the extremity of the fin. The spines are of moderate strength, broader on one side: the first is the shortest, about half the diameter of the eye; the following increase in length to the fifth, which is the tallest, one-half the length of the head; the last is rather longer than one-half the fifth. The anterior rays do not exceed in length the last spine, and the whole soft portion is covered with minute scales. The *caudal* is scaly at the base only, forked, each lobe being 4½ in the total length. The *anal* fin begins in a vertical from the last dorsal spine, and terminates a little behind the dorsal; the three spines are as strong as the dorsal ones: the first equals in length the second of the dorsal; the second is the tallest, 2½ in the length of the head; the third is intermediate between the first and second. The soft portion is very much like the corresponding part of the dorsal fin. The *pectorals* are scaly at the base, pointed, one-sixth of the total length, and do not reach to the vertical from the vent. The *ventrals* are inserted behind the pectorals and reach to the vent; their spine is not quite one-half the length of the head.

The *scales* are small, ctenoid.

The *teeth* of the jaws form a villiform band, with an outer series of stronger ones, which are very slightly flattened. There is a small patch of teeth on the head of the vomer.

The ground-colour is now a greyish-yellow, and appears to have been red in life. The back and the sides are banded with brown: an indistinct, very narrow line along the base of the dorsal. The first lateral band proceeds from the occiput, where it is united with its fellow, to, and along, the base of the soft dorsal; the second from the forehead, where it joins that of the other side, to the end of the dorsal and the back of the tail; the third from above the eye to the middle of the root of the caudal; the fourth (paler than the others) from the eye to the lower side of the root of the caudal; the fifth (the least distinct) from below the eye, above the pectoral, to the end of the anal. There is sometimes a sixth near the belly. The spinous dorsal is blackish; the caudal, pectoral, and ventral fins are greyish.

	inches.	lines.
Total length	5	11
Height of the body	2	0
Length of the head	1	4
——— of the fifth dorsal spine	0	8½
——— of the eleventh dorsal spine	0	5
——— of the caudal	1	3
——— of the second anal spine	0	6½
——— of the pectoral	1	0
——— of the ventral spine	0	7
——— of the largest specimen	8	0

The stomach is very spacious, with thin membranes; the intestinal tractus is 1½ as long as the fish; the testicles are separated from each other. The air-bladder is large, prolonged into two horns posteriorly, extending on both sides of the hæmal spines, and into two short processes anteriorly. Pseudobranchiæ well developed. Four gills, with a foramen behind the posterior.

Feeds on sea-weed and animal substances.

Third Group. TOXOTINA.

12. TOXOTES.

Toxotes, *Cuv. Règne Anim.*; *Cuv. & Val.* vii. p. 310.

Body compressed, oblong; snout rather produced, with the lower jaw longest; eye of moderate size. One dorsal with five spines, situated on the posterior part of the back; the soft portion and the anal scaly, the latter with three spines. Villiform teeth in the jaws, on the vomer and the palatine bones. Scales of moderate size, cycloid. Seven branchiostegals; air-bladder simple; pyloric appendages in moderate number.

East Indian Seas; Polynesia.

1. Toxotes jaculator.

Sciæna jaculatrix, *Pall. Spicil.* viii. p. 41, and *Phil. Trans.* vol. lvi. 1766, p. 186. tab. viii. f. 6 (scales too small).

Scarus schlosseri, *L. Gm.* p. 1282; *Lacép.* iv. pp. 5, 17; *Shaw, Zool.* iv. p. 398.

Labrus jaculatrix, *Lacép.* iii. pp. 425, 464; *Shaw, Zool.* iv. p. 485. pl. 68.

Cojus chatareus, *Buch. Ham.* pp. 201, 370. pl. 14. f. 34.

Toxotes jaculator, *Cuv. & Val.* vii. p. 314. pl. 192; *Cant. Catal.* p. 176; *Agass. Poiss. Foss.* iv. p. 262. pl. H; *Cuv. Règne Anim. Ill. Poiss.* pl. 44. f. 3; *Bleeker, Verh. Batac. Genootsch.* xxiii. *Chætod.* p. 31.

D. $\frac{5}{11-13}$. A. $\frac{3}{15-17}$. L. lat. 28. L. transv. $\frac{3-4}{7-8}$. Cæc. pylor. 7–9. Vert. 10/14.

The length of the snout equals the width of the space between the eyes. Greenish, with broad darker bands or spots across the back.

East Indian Seas; Polynesia.

a. Adult: stuffed. Calcutta. Purchased of Mr. Warwick.
b. Adult: skeleton. Amboyna. Purchased of Mr. Frank.
c. Half-grown. Molucca Sea. Purchased of Mr. Frank.
d, e. Half-grown and young. North Australian Expedition. Presented by Dr. J. R. Elsey.
f. Half-grown. India.
g. Adult. Old Collection.
h. Adult: stuffed.

Skeleton.— The conformation of the skull and of the whole skeleton is so totally different from that of *Chætodon*, that we should be fully justified in separating *Toxotes* from this family; and it might perhaps be much better to place it as a separate group or family, near the *Apogonina*. The maxillary bone is very slender, and shows no dilatation at the posterior extremity; the descending branch of the intermaxillary is similar in form to the maxillary, but the upper portion of the bone is much dilated, and has short posterior processes. The mandibula is thin and transparent, highest posteriorly, and gradually tapering anteriorly; there is no free space between the dentary and articular bones. The head of the vomer is subovate, broader than long, and entirely covered with minute teeth; the palatine and pterygoid bones have similar teeth, those of the former forming a narrow cuneiform band, of the latter an exceedingly large, elliptical patch; the glossohyal is well developed, broad, ovate, and toothed like the pterygoid. The præoperculum has neither a distinct interior ridge nor a muciferous channel; its limbs meet at a right angle; the lower is serrated, and nearly one-half the length of the posterior. The operculum is crescent-shaped, with the upper part truncated; it is twice as high as wide, and has no serrature or ridge whatever. The suboperculum is sword-shaped; the interoperculum has the lower margin convex. The præorbital, like the other infraorbitals, is very narrow; it is broadest superiorly, and its anterior margin is serrated. The turbinal bones are small, scale-like bones, which are in immediate contact with each other. There is another pair of bones, larger than the turbinals, difficult to be referred to any one of the typical bones of the skull of fishes; they are situated in front of the orbital portion of the principal frontals above the nasal opening, and separated from each other by the anterior portion of the frontals; they may be considered as a second pair of turbinals, or as supranasals. The prefrontals form the anterior portion of the orbit, and do not extend on to the upper surface of the skull.

The upper surface of the skull is broad, smooth, and rather flat, the crown being more depressed than the space between the orbits; the sutures are very indistinct. The occipital crest is feeble, and is scarcely prominent on the upper surface of the skull: there are two other crests on each side of the crown, with a groove between; the exterior is the stronger, and provided with a muciferous channel; the interior is feeble, and the suprascapula is fixed to it. The humeral is slender and styliform. The coracoid and the radius are thin, and not entirely ossified, and form together a broad cavity for the muscles of the pectoral fin; their junction with the opposite bones is unusually broad and firm. The pubic bones are very narrow and of moderate length; each is composed of three lamellæ, the upper and lower of which are merely indicated.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·1. The first vertebra is slightly compressed in its longitudinal diameter. The neural, hæmal, &c. spines are rather feeble. There are five or six spurious interneurals, all being much inclined backwards, and the two anterior of which are dilated into transparent lamellæ; the interneurals of the dorsal spines are, of course, the strongest. The first interhæmal is of moderate strength and length, and it inclines backwards with the upper extremity. The ribs are of moderate strength, and some of the anterior ones are provided with epipleural spines.

2. Toxotes microlepis.

D. $\frac{5}{13}$. A. $\frac{3}{17}$. L. lat. 42. L. transv. 6/14.

The length of the snout is less than the width of the space between the orbits. Four black blotches along the upper part of the side.

Siam.

a–c. Fine specimens. Siam. From Mr. Mouhot's Collection.

Description.—Great as is the similarity between this and the other species, the new one may readily be distinguished by the much smaller scales and the shortness of the snout. In the general habit and in all the generic characters, the present species completely agrees with *T. jaculator*; the snout, however, is much shorter, its length being scarcely more than the diameter of the eye, and considerably less than the width between the orbits. The diameter of the eye is one-fourth of the length of the head. The length of the base of the anal equals exactly that of the dorsal. One of the largest scales covers two-thirds of the eye.

The colour may prove to be subject to as much variation as in the other species. The specimens described are yellowish, with greenish back and yellowish caudal. There is a series of four black blotches on each side: the anterior is the smallest, and situated on the upper extremity of the præoperculum; the third is the largest, and placed opposite the dorsal spines; a narrow blackish band round the base of the caudal; a round black spot on the posterior angle of the dorsal; the anal and the ventrals are black.

	inches.	lines.
Total length	6	0
Height of the body	2	6
Length of the head	1	8
Width between the eyes	0	7
Diameter of the eye	0	5
Length of the snout	0	5¾
——— of the fourth dorsal spine	1	0
——— of the base of the dorsal	1	10
——— of the base of the anal	1	10
——— of the third anal spine	0	9½
——— of the pectoral	1	2
——— of the ventral	0	9
——— of a large scale	0	4
Height of a large scale	0	3¼

Fam. 9. CIRRHITIDÆ.

Percoidei, pt., et Sciænoidei, pt., *Cuvier, Müller.*
Percidæ, pt., et Sciænidæ, pt., *Owen.*
Cirrhitidæ, *Gray, Syn. Brit. Mus.*
Theraponidæ, pt., et Polynemidæ, pt., *Richardson, Ichthyol.*
Cirrhitoidei, *Bleek. Act. Soc. Scient. Indo-Nederl.* ii. *Amboina,* p. 39.

Body compressed and oblong, covered with cycloid scales; lateral line continuous. Mouth in front of the snout, with lateral cleft. Eye lateral, of moderate size. Cheeks not cuirassed. Generally six, sometimes five, in one genus three branchiostegals. Dentition more or less complete, composed of small pointed teeth, sometimes with the addition of canines. *One dorsal fin, formed by a spinous and soft portion of nearly equal development.* Anal with three spines, generally less developed than the soft dorsal*. *The lower rays of the pectoral fins simple and generally stout;* ventrals thoracic, but remote from the root of the pectorals, with one spine and five rays. [Air-bladder either absent or with many appendages, in the species examined.]

Carnivorous fishes, inhabiting the seas of the tropical regions and the southern temperate parts of the Pacific.

This family might be divided into two smaller groups, the type of the one of which would be *Cirrhites,* of the other *Chilodactylus,* if it were not for *Chironemus,* which connects them so closely together, that it would be difficult to decide to which of the two groups it ought to be referred.

Synopsis of the Genera.

A. *Anal fin not elongate.*

1. *Vomerine teeth.*

No palatine teeth; dorsal spines 10; intermaxillary not denticulated	1. CIRRHITES.
Palatine teeth; dorsal spines 10	2. CIRRHITICHTHYS.
No palatine teeth; dorsal spines 10; intermaxillary denticulated	3. OXYCIRRHITES.
Dorsal spines 15	4. CHIRONEMUS.

2. *No vomerine teeth.*

Six (five) branchiostegals; villiform bands of teeth in both the jaws	5. CHILODACTYLUS.
Lower jaw without teeth	6. MENDOSOMA.
Three branchiostegals; a single series of teeth in both the jaws	7. NEMADACTYLUS.

B. *Anal fin elongate.*

The spinous portion of the dorsal fin with 17 spines	8. LATRIS.

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* Cfr. the genus *Latris.*

1. CIRRHITES.

Cirrhites, (*Commers., Lacép.*) *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 66.

The five to seven lower pectoral rays are simple; dorsal with ten spines. Villiform teeth in both the jaws, with the addition of canines; teeth on the vomer; none on the palatine bones. Six branchiostegals. Præoperculum denticulated; operculum without spines. Scales cycloid, of moderate size. Air-bladder none; pyloric appendages in small number.

From the eastern coasts of Africa to Polynesia.

1. **Cirrhites forsteri.**

Seba, iii. 27. 12; *Renard*, i. 9. 61.
Perca tæniata, *Forster*.
Grammistes forsteri, *Bl. Schn.* p. 191.
Sparus pantherinus, *Lacép.* iv. p. 160. pl. 6. f. 1.
Cirrhites pantherinus, *Cuv. & Val.* iii. p. 70; *Less. Voy. Coq. Poiss.* p. 225. pl. 22. f. 1; *Bleeker, Banda*, i. p. 232.
Serranus tankervillæ, *Benn. Fishes of Ceylon*, pl. 27.

D. $\frac{10}{11}$. A. $\frac{3}{6}$. L. lat. 50. L. transv. 5/12. Cæc. pylor. 4. Vert. 10/16.

Seven simple pectoral rays; the pectoral does not reach so far backwards as the ventral. Head and breast with deep-black points; a broad yellow band from above the pectoral to the lower half of the caudal fin; a broad black band above it from the middle of the body to the upper half of the caudal.

From the eastern coasts of Africa to the Pacific; Cape Seas.

a. Adult. Mauritius. Presented by the Zoological Society.
b. Adult: stuffed. Mauritius.
c. Adult: stuffed: not good state. Cape Seas. Presented by Sir A. Smith.
d, *e*. Adult and half-grown. India. Old Collection, as *Perca cruentata*.
f. Adult: skeleton. India. From the Collection of the Zoological Society.
g. Adult: skeleton. India. From Mr. Frank's Collection.

Skeleton.—The skull is compressed, all the bones being well ossified, and very solid. The intermaxillary is much shorter than the maxillary, and has the posterior processes of moderate length. The maxillary is slightly bent sword-shaped, broadest at the extremity. The mandibulary has some small pores along the lower side. The head of the vomer is thick, swollen, and armed with teeth on the anterior margin only. The præoperculum is crescent-shaped, without angle, and with the posterior part of the margin minutely serrated; the interior ridge is very low. The outlines of the operculum are very irregular: the posterior margin is notched, but there are no spines; the inferior margin is waved. The interoperculum is bent, with the side joining the suboperculum emarginate. The suboperculum is elongated, with the posterior extremity produced beyond the operculum. The præorbital broad, rhomboid. The space between the orbits is rather narrow and flat. The occipital crest well developed, triangular; the lateral crests are scarcely visible. The bones of the humeral arch are rather strong, and both the coracoid bones are joined together by a long horizontal suture. The lower extremity of the radius is provided with several peculiar processes. The pubic bones are rather elongate and narrow; each of them is formed by three lamellæ of nearly equal development.

There are ten abdominal and sixteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·5. The neural and hæmal spines are of moderate length and strength; each of the interneurals is dilated. The first interhæmal is very strong, and evidently formed by two; it has two ridges on each side, and a low one anteriorly.

2. Cirrhites punctatus.

Cuv. & Val. iii. p. 70.

D. $\frac{10}{11}$. A. $\frac{3}{6}$. L. lat. 42. L. transv. 5/10.

Head and trunk marbled with brown, and with scattered black points. Seven simple pectoral rays. The pectoral reaches to the origin of the anal fin.

Indian Ocean?

a. Adult: stuffed. Sine patria.

3. Cirrhites arcatus.

Valent. iii. p. 497. fig. 470; *Renard*, i. 18. 102.

Cirrhites arcatus, (*Parkins.*) *Cuv. & Val.* iii. p. 74; *Richards. Voy. Samar. Fishes*, p. 26. pl. 5. f. 3–5; *Less. Voy. Coq. Zool.* ii. p. 227; *Cuv. Règne Anim. Ill. Poiss.* pl. 10. f. 2; *Bleek. Act. Soc. Nederl.* i. *Manado en Macassar*, p. 41.

Cirrhites vittatus, (*Valenc.*) *Cuv. Règne Anim. Ill. Poiss.* p. 39.

D. $\frac{10}{11}$. A. $\frac{3}{6}$. L. lat. 50. L. transv. $\frac{5}{12}$. Cæc. pylor. 4.
Vert. 10/16.

Seven simple pectoral rays; the first dorsal ray elongate. A white band above the lateral line from the middle of the body to the upper half of the caudal; a whitish semicircular line behind the orbit, edged with brown.

From the Mauritius to the Pacific.

a. Adult. Mauritius. From the Haslar Collection.
b. Adult: skeleton. Presented by Sir J. Richardson.

Skeleton.—The skeleton is very similar to that of *C. forsteri*; it differs, however, by the occipital crest, which, instead of being triangular, is semilunate. The first interhæmal has a longitudinal groove anteriorly.

4. Cirrhites amblycephalus.

Bleeker, Sangi, p. 378.

D. $\frac{10}{11}$. A. $\frac{3}{6}$. L. lat. 48.

Seven simple pectoral rays; the first dorsal ray elongate. Orange-coloured, with about sixteen brownish longitudinal streaks; a brown spot behind the eye, edged with yellow. (*Bl.*)

Sea of Sangi.

5. Cirrhites aprinus.

Cuv. & Val. iii. p. 76.

D. $\frac{10}{12}$. A. $\frac{3}{6}$.

Six simple pectoral rays; dorsal very distinctly notched. Red, with six blackish vertical bands, extending on the dorsal; dorsal fin dotted with black. (*Cuv.*)

Sea of Timor.

6. Cirrhites fasciatus.

Cuv. & Val. iii. p. 76. pl. 47 (not *Bennett*).

D. $\frac{10}{12}$. A. $\frac{3}{6}$.

Five simple pectoral rays; dorsal deeply notched. Greyish, with blackish cross-bars; head, back, and dorsal with small white spots. (*Cuv.*)

Coast of Pondicherry.

7. Cirrhites cinctus.

Cirrhites fasciatus, *Benn. Zool. Journ.* 1829, p. 39 (not *Cuv.*).

D. $\frac{10}{14}$. A. $\frac{3}{6}$. L. lat. 49. L. transv. 5/12.

Six simple pectoral rays, the longest of which reaches nearly to the anal. Brownish-olive, with five brown cross-bars; the first across the operculum, where it forms a dark-coloured spot; the last nearly black, behind the dorsal fin; head and anterior part of the body minutely dotted with whitish.

Coasts of Madagascar, Ile de France, and Sandwich Islands.

a. Adult. Sandwich Islands. Presented by the Zoological Society.—Type of Mr. Bennett's description.
b. Adult. Madagascar. Presented by Dr. J. E. Gray.
c. Adult: stuffed. Ile de France.
d. Adult: not good state. From the Haslar Collection.

2. CIRRHITICHTHYS.

Cirrhitichthys, *Bleek. Act. Soc. Scient. Indo-Nederl.* ii. *Amboina*, p. 39.

The five or six lower pectoral rays are simple. D. $\frac{10}{11-12}$. A. $\frac{3}{5-9}$ Villiform teeth in both the jaws, with the addition of canines; teeth on the vomer and the palatine bones. Six branchiostegals. Præoperculum denticulated; operculum spiniferous. Scales cycloid, of moderate size. Air-bladder none; pyloric appendages in small number.

East Indian Seas.

1. Cirrhitichthys oxyrhynchus.

Bleeker, Goram, p. 205.

D. $\frac{10}{12}$. A. $\frac{3}{6}$. L. lat. 40.

The length of the head is $3\frac{2}{5}$ in the total; the snout pointed, the distance between the end of the snout and the extremity of the maxillary bone being more than the diameter of the eye. The fifth and sixth dorsal spines longest, half the height of the body. Five simple pectoral rays, the longest of which reach to the anal; the second anal spine strong, and much longer than the longest of the dorsal. Rose-coloured: the head with three bands; the body with nine or ten rather irregular cross-bands; a round deep-brown spot below the middle of the soft dorsal fin, extending on the membrane of the fin; the spinous dorsal and the anal brown-spotted. (*Bl.*)

Sea of Goram.

2. Cirrhitichthys graphidopterus.

Cirrhites graphidopterus, *Bleek. Amboina,* iii. p. 106.

D. $\frac{10}{12}$. A. $\frac{3}{6}$. L. lat. 38–42.

The length of the head is one-fourth of the total; præorbital denticulated posteriorly. Dorsal spines strong; the sixth is the longest, half the height of the body; the first dorsal ray produced into a filament. Six simple pectoral rays, the longest of which reaches nearly to the anal fin. Rose-coloured: head with some bands; body with irregular cross-bands, alternating with large spots; the soft dorsal with round black spots.

Sea of Amboyna.

a, b. Fine specimens. Amboyna. Purchased of Mr. Frank.

3. Cirrhitichthys maculatus.

Cirrhites maculatus, *Lacép.* v. p. 3; *Cuv. & Val.* iii. p. 69.
Labrus marmoratus, *Lacép.* iii. p. 492. pl. 5. f. 3.
Cirrhites maculosus, *Bennett, Zool. Journ.* 1829, p. 38.

D. $\frac{10}{11}$. A. $\frac{3}{6}$. L. lat. 40–42. L. transv. 4/9. Vert. 10/16.

Seven simple pectoral rays. The pectoral does not reach to the vent. Body and vertical fins spotted with brown; a series of darker spots along and behind the base of the dorsal fin. Palatine bones with a very small patch of teeth anteriorly.

From the Red Sea and the Sea of the Ile de France to the Pacific.

a. Adult. Polynesia.
b. Adult. India. Old Collection, as *Perca gobioides.*

c. Adult: skeleton. India. Old Collection, as *Perca gobioides.*
d. Half-grown. Sandwich Islands. Presented by the Zoological Society.
e. Adult: stuffed. Red Sea.
f. Adult: stuffed. Ile de France.
g. Adult: stuffed. From the Collection of the Zoological Society, as *Cirrhites armillatus.*

Skeleton.—The skeleton of this species is very similar to that of *Cirrhites forsteri*; it differs only by a much lower occipital crest, and by the posterior extremity of the frontal bones being more convex.

4. Cirrhitichthys oxycephalus.

Cirrhites oxycephalus, *Bleeker, Amboina,* vi. p. 408.

D. $\frac{10}{12}$. A. $\frac{3}{6}$. L. lat. 40.

The length of the head is one-fourth of the total; the snout is a little shorter than the eye. Præorbital without any denticulations. The fourth and fifth dorsal spines are longest, and $1\frac{1}{3}$ or $1\frac{1}{2}$ in the height of the body; the first dorsal ray produced into a filament. Six simple pectoral rays, the longest of which reaches to the anal; the second anal spine strong, and longer than the longest of the dorsal. Rose-coloured: body with five oblique cross-bands, and with spots between the bands; head with two transverse bands. (*Bl.*)

Sea of Amboyna.

a. Young.

5. Cirrhitichthys aureus.

Cirrhites aureus, *Temm. & Schleg. Faun. Japon. Poiss.* p. 15. pl. 7. f. 2.

D. $\frac{10}{12}$. A. $\frac{3}{6}$. L. lat. 43. L. transv. 5/10.

Six simple pectoral rays, the longest of which reach beyond the origin of the anal; the first dorsal ray elongate. Uniform orange-coloured.

Chinese and Japanese Seas.

a. Adult. China. Presented by J. R. Reeves, Esq.

3. OXYCIRRHITES.

Oxycirrhites, *Bleek. Act. Soc. Scient. Indo-Nederl.* ii. *Amboina,* p. 39.

The five lower pectoral rays are simple; dorsal with ten spines. Villiform teeth in both the jaws, without canines; teeth on the vomer; none on the palatine bones. The intermaxillary bones well developed and much produced, denticulated on the descending and ascending processes. Præoperculum denticulated; operculum spiniferous. Scales cycloid, of moderate size. Six branchiostegals.

Seas of Amboyna and Ile de France.

1. Oxycirrhites typus.

Bleeker, l. c. p. 40.

D. $\frac{10}{13}$. A. $\frac{3}{7}$. L. lat. 55.

Five simple pectoral rays. Head with three brown longitudinal bands; body with eight or nine oblique transverse and four longitudinal bands of the same colour.

Seas of Amboyna and Ile de France.

a. Adult: stuffed: not good state. Ile de France.

4. CHIRONEMUS.

Chironemus, *Cuv. & Val.* iii. p. 78.
Threpterius, *Richards. Proc. Zool. Soc.* 1850, p. 68, and *Ann. & Mag. Nat. Hist.* 1851, vii. p. 284.

The six or seven lower pectoral rays are simple; dorsal with fifteen spines. Villiform teeth in both jaws, without canines; teeth on the vomer; none on the palatines. Six branchiostegals. Præoperculum entire; operculum with points. Scales cycloid, of moderate size. Air-bladder none; pyloric appendages in small number.

Australian Seas.

1. Chironemus georgianus.

Cuv. & Val. iii. p. 78.

D. $\frac{15}{16}$. A. $\frac{3}{7}$. Cæc. pylor. 4.

Seven simple pectoral rays; the base of the soft dorsal half as long as that of the spinous. (*Cuv.*)

King George's Sound.

2. Chironemus marmoratus.

D. $14 \left| \frac{1}{18} \right.$. A. $\frac{3}{6}$. L. lat. 55.

Six simple pectoral rays. The base of the soft dorsal rather shorter than that of the spinous. The fifth dorsal spine longest.

Western coasts of Australia.

a. Adult: skin. Swan River. From Mr. Macgillivray's Collection.
b. Adult: skin. Darnley Island. From Mr. Macgillivray's Collection.

Description.—The height of the body equals the length of the head, and is about one-fourth of the total; the form of the body being rather elongate, with the upper profile slightly convex. The interspace between the eyes appears to be concave. The snout is moderately pointed, and longer than the diameter of the eye. The upper maxillary reaches to the vertical from the anterior margin of the orbit. The præorbital is triangular, with the inferior margin very convex; the remainder of the infraorbital ring is narrow. The membrane of the anterior nostril is produced into a short appendage. The diameter of the eye is about one-fourth of the length of the head. I cannot detect any scales on the cheek. The margin of the præoperculum is rounded, and without any denticulations whatever. The operculum terminates in two rather prominent points; the suboperculum is produced into a flap, which overreaches the lower opercular spine. The suprascapula has no serrature.

The *dorsal* fin begins vertically above the opercular spine, and terminates at a short distance from the caudal. There is a deep notch between the two portions of the fin; the length of the base of the soft is rather shorter than that of the spinous, and both can be received in a low scaly groove. The margin of the spinous portion is convex, that of the soft straight and descending obliquely backwards. The spines are rather strong: the length of the first is three-fifths of the second; the following gradually become longer to the fifth, which is more than one-third of the length of the head. The posterior spines gradually decrease in length to the fourteenth, which equals the second; the fifteenth, belonging to the soft portion, is, again, somewhat longer. The anterior portion of the soft dorsal is highest, the first two rays being a little longer than the fifth spine. The *caudal* is truncated, and about one-seventh of the total length. The *anal* is very short and elevated: the first spine corresponds to the fifth dorsal ray, and is one-half the length of the second spine; the second is rather stronger, but not longer than the third, and one-third of the length of the head. The first and second rays are much longer than any of the dorsal fin, and $1\frac{2}{3}$ in the length of the head; the following rays diminish in length. The *pectoral* is rounded, and composed of nine branched rays and six simple ones; the latter project considerably beyond the margin of the fin, and the membrane between them is very deeply notched. The *ventral* is inserted much more backwards, and its base corresponds to the eighth dorsal spine; the spine is about two-thirds the length of the adjacent ray; the entire length of the fin is about one-seventh of the total.

The *scales* are cycloid, of moderate size, and rather irregularly arranged. The lateral line is inconspicuous, and runs in a nearly straight line.

The *teeth* in the jaws form broad villiform bands; the vomerine band is much narrower, and bent at an obtuse angle. The pharyngeal teeth are obtuse, cardiform, and form large rounded patches.

The head and body are now yellowish, largely marbled with dark brown; the spinous dorsal is blackish; all the other fins are spotted with brown.

	inches.	lines.
Total length	8	4
Height of the body........................	2	1
Length of the head	2	1
Diameter of the eye	0	6
Length of the fifth dorsal spine	0	9
——— of the second anal spine	0	8
——— of the second anal ray	1	3
——— of the upper simple pectoral ray ..	1	11
——— of the adjacent branched ray	1	7

3. Chironemus maculosus.

Threpterius maculosus, *Richards. Proc. Zool. Soc.* 1850, p. 70. pl. 2. f. 1, 2, and *Ann. & Mag. Nat. Hist.* 1851, vii. p. 285.

D. $\frac{14}{18}$. A. $\frac{3}{7}$. L. lat. 52.

The length of the base of the soft dorsal is two-thirds of that of the spinous. Seven simple pectoral rays. Præorbital narrow. Membrane between the dorsal spines deeply notched, and produced into a small free lobe behind each spine. Pale brown: head, body, the soft dorsal, caudal and anal fins spotted with blackish.

King George's Sound.

5. CHILODACTYLUS.

Cheilodactylus, (*Lacép.*) *Cuv. Règne Anim.*; *Cuv. & Val.* v. p. 356.

One dorsal fin, with sixteen to nineteen spines; the anal fin of moderate length; the caudal forked; one of the simple pectoral rays more or less exceeding the fin in length. Teeth in villiform bands; no canines; no teeth on the palatine bones or vomer. Præorbital and præoperculum entire. Scales of moderate size, cycloid. Cheeks scaly. Six (five) branchiostegals. Air-bladder with many lobes (at least in some of the species); pyloric appendages in small number.

Tropical parts of the Pacific; Chinese Seas; Cape of Good Hope.

1. Chilodactylus carponemus

Sparus carponemus, *Parkinson.*

Chilodactylus carponemus, *Cuv. & Val.* v. p. 362. pl. 128; *Richards. Proc. Zool. Soc.* 1850, p. 61, and *Ann. & Mag. Nat. Hist.* 1851, vii. p. 277.

B. 6. D. $\frac{17}{31}$. A. $\frac{3}{19}$. Cæc. pylor. 2.

Seven rays of the pectoral fin simple, the longest reaching nearly to the end of the anal, and one-third of the total length. Dorsal scarcely notched. Coloration uniform; the caudal with blackish tips.

Coasts of New Zealand and South Australia.

2. Chilodactylus macropterus.

Sciæna macroptera, *Forst.*

Cichla macroptera, *Bl. Schn.* p. 342.

Cheilodactylus macropterus, *Richards. Proc. Zool. Soc.* 1850, p. 62, and *Ann. & Mag. Nat. Hist.* 1851, vii. p. 278.

D. $\frac{17}{26}$. A. $\frac{3}{14}$. L. lat. 55. L. transv. 6/17.

Six simple pectoral rays, the uppermost of which is very elongate, and reaches to the fourth soft ray of the anal. Dorsal fin notched: the seventh spine is the longest, higher than the soft dorsal, and one-half the length of the head; the second anal spine strong, and longer than the third. A blackish band from the origin of the dorsal to the shoulder and the base of the pectoral.

Australian Seas.

a. Adult: not good state. Port Arthur. Presented by Sir J. Franklin.
b. Adult: stuffed. Australia. Voyage of H.M.S. Herald.
c. Half-grown: stuffed. Port Essington. Purchased of J. Gould, Esq.

3. **Chilodactylus aspersus.**

Cheilodactylus carponemus, *Richards. Zool. Trans.* iii. p. 99 (not *Cuv. & Val.*; formula of the fins taken from *C. & V.*).
—— aspersus, *Richards. Proc. Zool. Soc.* 1850, p. 64, and *Ann. & Mag. Nat. Hist.* 1851, vii. p. 280.

B. 6. D. $\frac{18}{27}$. A. $\frac{3}{11}$. L. lat. 55–57. L. transv. 6/15.

Six simple pectoral rays, the uppermost of which is very elongate, and reaches beyond the origin of the soft anal. The spines of the fins are strong: the fifth of the dorsal is the longest, higher than the soft dorsal, and $2\frac{1}{5}$ in the length of the head. Brownish, with scattered black specks.

Coasts of Van Diemen's Land.

a. Fifteen inches long: bad state; has been in chloride of zinc. Port Arthur. Presented by Sir J. Richardson.—Type of the species.
b. Adult: bad state. Port Arthur. From the Haslar Collection.

4. **Chilodactylus nigricans.**

Richards. Proc. Zool. Soc. 1850, p. 63, and *Ann. & Mag. Nat. Hist.* 1851, vii. p. 279.

D. $\frac{15}{26}$. A. $\frac{3}{10}$. L. lat. ca. 48.

Five simple pectoral rays, the uppermost of which is the longest, and projects only about one-sixth of its length beyond the membrane. The sixth and tallest dorsal spine equals one-third of the height of the body, and is higher than the soft rays, which rise considerably above the posterior spines. Uniform blackish-grey. (*Rich.*)

King George's Sound.

5. **Chilodactylus grandis.**

D. $\frac{17}{23}$. A. $\frac{3}{9}$. L. lat. 53. L. transv. 7/13.

Six simple pectoral rays, the second of which is elongate and reaches nearly to the vent; the others are gradually shorter. Dorsal fin notched, with both portions of nearly equal height. Coloration uniform (in dried state).

Cape Seas.

a. Large stuffed specimen. Cape Seas. Presented by Sir A. Smith.

Description of the specimen.—The form of the body is rather elongate, with the upper and lower profiles slightly convex. The greatest depth of the body is beneath the sixth dorsal spine, and is contained $4\frac{1}{7}$ in the total length. The length of the head is $4\frac{1}{2}$ in the total; the interspace between the eyes is one-fifth of the length of the head. The snout is produced, the eye being somewhat more remote from the extremity of the snout than of the operculum; the cleft of the mouth is rather small, and the upper maxillary does not reach to the vertical from the anterior margin of the orbit. The eye is of moderate size, one-sixth of the length of the head. The cheek, the opercles, and the interspace between the eyes are densely covered with small scales. The præoperculum has the posterior margin vertical and the angle rounded; the suboperculum overreaches the operculum posteriorly.

The *dorsal* fin begins vertically above the suprascapula and ends at a short distance from the caudal, in the vertical from the 44th scale of the lateral line. The length of the base of the spinous portion is rather shorter than that of the soft; the upper margin of the former is slightly convex, that of the latter straight and somewhat oblique. The spines are moderately strong. the first is one-half the length of the second; the following gradually become longer to the fifth, which is one-third of the length of the head; and the posterior ones decrease in length to the last, which is about half as long as the first rays; these are the longest, and equal to the fifth dorsal spine. There is a low scaly sheath along all the length of the fin. The *caudal* is deeply forked, one of the middle rays being one-third only of the upper lobe; both lobes are pointed. The *anal* fin is short, and begins in the vertical from the sixth dorsal ray: the first spine is one-third the length of the second; the second is moderately stout, and shorter than the third; the third is one-third of the first and second rays, which are the longest, and one-half the length of the head; the other rays diminish in length. The *pectoral* is composed of eight branched rays and six simple ones, the second of which is the longest, and much exceeding the others in length. I cannot state the exact length of this ray, as it is dried and shrunk, but I suppose that it reaches nearly to the vent. The next ray also is very elongate, one-fourth of its entire length projecting beyond the membrane; the other rays are gradually shorter. The base of the *ventrals* is very remote from that of the pectoral, and falls in the vertical from the tenth dorsal spine; the length of the fin is about one-ninth of the total, and the spine is two-thirds of the length of the fin.

The *scales* are of moderate size, cycloid.

The *teeth* form villiform bands in both jaws.

	inches.	lines.
Total length	27	0
Height of the body	6	6
Length of the head	6	1
Diameter of the eye	1	0
Distance between the eyes	1	3
Length of the fifth dorsal spine	2	0
——— of the second anal ray	3	3
——— of the ventral	2	0

6. Chilodactylus brachydactylus.

Cuv. & Val. v. p. 361.

D. $\frac{17-18}{31}$. A. $\frac{3}{9}$. L. lat. 50. L. transv. 6/13.

The simple rays of the pectoral short, one-fifth longer than the branched ones. The spinous dorsal low; the sixth spine, which is the longest, $3\frac{1}{2}$ in the length of the head. Uniform brown.

Cape of Good Hope.

a. Adult: not good state. Cape of Good Hope. Purchased of Mr. Frank as *Ch. gronovii*.
b. Adult: stuffed. Cape of Good Hope. Purchased of Sir A. Smith.
c. Half-grown. Purchased of Mr. Frank.

7. Chilodactylus monodactylus.

Chætodon monodactylus, *Carmich. Trans. Linn. Soc.* xii. p. 300. pl. 21.
Chilodactylus carmichaelis, *Cuv. & Val.* v. p. 360, ix. p. 489; *Gay, Hist. Chil. Zool.* ii. p. 197; *Cuv. Règne Anim. Ill. Poiss.* pl. 31. f. 2.

B. 6. D. $\frac{17}{24}$. A. $\frac{3}{12}$. L. lat. 45.

The six lower pectoral rays simple, the longest reaching to the second anal spine. The second anal spine very strong. Body with some indistinct vertical bands; a blackish blotch on the shoulder and below the eye.

Coasts of Chile.

8. Chilodactylus fasciatus.

Cynædus, *Gronov. Zoophyl.* p. 64. no. 221. pl. 10. f. 1.
Cheilodactylus fasciatus, *Lacép.* v. p. 6. pl. 1. f. 1; *Cuv. & Val.* v. p. 367.
Trichopterus indicus, *Gronov. Syst. ed. Gray*, p. 162.

B. 5. D. $\frac{18}{23}$. A. $\frac{3}{11}$. L. lat. 75. Vert. 14/20.

Five rays of the pectoral simple, the length of the longest being one-fourth of the total. Dorsal fin scarcely notched; the spinous portion little elevated and nearly even. Brown (in a dried state), with six or seven vertical bands; on each caudal lobe five transverse bands.

Cape of Good Hope.

a. Adult: stuffed: not good state.
b. Adult: stuffed: not good state. Presented by Sir A. Smith.
c. Adult: skin. From Gronov's Collection.

9. Chilodactylus variegatus.

Cheilodactylus variegatus, *Cuv. & Val.* ix. p. 494; *Gay, Hist. Chil. Zool.* ii. p. 199.
—— tschudii, *Müll. & Trosch. Hor. Ichth.* iii. p. 25.
—— cinctus, *Tschudi, Faun. Per. Ichthyol.* p. 15. taf. 2.

B. 6. D. $\frac{16}{31}$. A. $\frac{3}{10}$.

Six or seven simple pectoral rays, none of which are elongate.

Dorsal fin low. The upper side of the head and the anterior part of the back black, the remainder lighter. Six blackish cross-bars from the base of the dorsal to the sides.

Coasts of Chile and Peru.

10. **Chilodactylus antonii.**

Cuv. & Val. ix. p. 494; *Gay, Hist. Chil. Zool.* ii. p. 201, *Atl. Ictiol.* lam. 5 bis, f. 2.

D. $\frac{17}{29}$. A. $\frac{3}{7}$.

Five simple pectoral rays, the longest of which exceeds the pectoral by one-sixth of its length; the seventh dorsal spine is about the longest. Body with four or five greenish cross-bands; cheek dotted with blackish.

Coast of Chile.

11. **Chilodactylus nigripes.**

Richards. Proc. Zool. Soc. 1850, p. 66, and *Ann. & Mag. Nat. Hist.* 1851, vii. p. 281.

D. $\frac{18}{26}$. A. $\frac{3}{10}$. L. lat. 61.

Five simple pectoral rays, the second of which is the longest, and falls short of the vent, while about one-third of its length projects beyond the membrane. Dorsal fin notched; the fifth and longest dorsal spine exceeds rather more than one-third of the height of the body. An eminence above the upper angle of the orbit. Fins black. (*Rich.*)

King George's Sound.

12. **Chilodactylus zonatus.**

Labre du Japon, *Krusenst. Reise, Atl.* taf. 63. f. 1.

Cheilodactylus zonatus, *Cuv. & Val.* v. p. 365. pl. 129; *Faun. Japon. Poiss.* p. 64. pl. 29; *Richards. Ichth. China*, p. 239, *Proc. Zool. Soc.* 1850, p. 66, and *Ann. & Mag. Nat. Hist.* 1851, vii. p. 282; *Bleek. Verhand. Batav. Genootsch.* xxvi. *Japan*, p. 83.

D. $\frac{17}{31-32}$. A. $\frac{3}{8}$. L. lat. 60. L. transv. 9/16.

The simple rays of the pectoral of moderate length, the longest reaching to the vertical from the vent. Dorsal fin deeply notched; the anterior part of the spinous dorsal elevated; the fourth spine is the longest, and three-fifths of the length of the head. Brownish, with several dark-brown oblique cross-bands; opercular membrane deep black; the soft dorsal with a blackish longitudinal band; caudal with round light spots edged with brownish. In very old specimens a pair of tubercles on the forehead and another on the snout.

Chinese and Japanese Seas.

a. Adult. China. Presented by J. R. Reeves, Esq.

b. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
c. Adult: skin. China. Purchased of Mr. Warwick.
d, e. Adult: stuffed. Japan.

13. Chilodactylus quadricornis.

D. $\frac{17}{27}$. A. $\frac{3}{8}$. L. lat. 54. L. transv. 9/17

Six simple pectoral rays, the second of which is very elongate and extends to the anal fin; the fourth and fifth dorsal spines very strong, and much higher than the soft dorsal. Four horn-like prominences—one pair before the eyes and the other above the snout. Head and body with eight broad, oblique, black cross-bars, five of which extend on the dorsal fin.

Sea of Japan.

a. Adult: stuffed. Japan. Purchased of Mr. Frank as *Ch. zonatus*, var.

Description of the specimen.—This species is allied to *Ch. zonatus* and *Ch. gibbosus*, from which, however, it may be readily distinguished by the smaller number of dorsal rays. The height of the body is $3\frac{1}{5}$ in the total length, the length of the head $4\frac{1}{5}$. The upper profile descends abruptly in a strong curve between the origin of the dorsal fin and the scaleless interspace between the orbits, the nape of the neck being much more compressed than the upper surface of the head. The upper profile of the head descends in a less bent curve; the interspace between the eyes is flat and broad, its width being $4\frac{1}{4}$ in the length of the head. There is a horn-like process above each upper anterior angle of the orbit. The upper extremity of the maxillary bones also is prominent, forming a second pair of horns above the snout, smaller than those of the frontal bones. The cleft of the mouth is rather small, the upper maxillary not extending to the vertical from the anterior margin of the orbit. The snout is scarcely longer than the diameter of the eye, which is large, and $3\frac{2}{3}$ in the length of the head; it is situated high up the sides, and the upper margin of the orbit is slightly elevated. The cheeks and the limbs of the præoperculum are covered with very small scales; those of the other opercles are rather larger. The posterior limb of the præoperculum is vertical, the lower horizontal; the angle is rounded.

The *dorsal* fin begins immediately behind the vertical from the suprascapula, and is continued to a small distance from the caudal. The base of the spinous portion of the dorsal is rather longer than that of the soft, and both can be received in a low scaly sheath. The anterior part, from the fourth and fifth spines, is suddenly elevated, and then gradually becomes lower to the last spine; the anterior part of the soft dorsal, again, is elevated, and then the upper profile descends in a slightly oblique straight line. The first three spines are short; the fourth and fifth are very strong, compressed, high, and more than one-half the length of the head. The anterior and longest dorsal rays are two-thirds of the length of the longest spine. The *caudal* fin is deeply notched; the upper lobe is the longest. The origin of the *anal* corresponds to the sixth dorsal ray; the spines are moderately developed: the first is less than one-half the length of the second, the second stronger and rather shorter than the third, the third less than one-half of the first and second rays, which are equal in length to the longest dorsal spines; the posterior rays rapidly decrease in length. Of the length of the *pectoral* rays, which are dried and shrunken, an approximate statement only can be given. The second simple ray is very elongate, and appears to reach to the origin of the anal; the other rays, beneath it, also project beyond the membrane, and the inferior ones become gradually shorter. The base of the *ventral* is very remote from that of the pectoral, and falls below the ninth dorsal spine; its length is about one-seventh of the total, and the length of the spine is three-fifths of the adjacent ray.

The *scales* are of moderate size, cycloid, with the free surface finely granulated.

The *ground-colour* is now dirty-yellowish—probably red or rose-coloured in life. The head and body are crossed by eight black bands, descending backwards in an oblique direction: the first is nearly vertical, below the eye; the second from the nape of the neck across the shoulder to the root of the pectoral; the third from the membrane between the first four dorsal spines towards the root of the ventral, to which, however, it does not extend. The three following bands terminate shortly below the lateral line: the fourth from the upper margin of the dorsal between the sixth and tenth spines; the fifth from the margin between the last five spines; the sixth from the membrane and base between the ninth and sixteenth dorsal rays; the seventh from the membrane and base between the last nine rays round the tail; the eighth round the root of the caudal fin. There do not appear to be any other spots on the fins.

	inches.	lines.
Total length	12	0
Height of the body	3	2
Length of the head	2	10
Diameter of the eye	0	9
Distance between the eyes	0	8
Length of the fourth dorsal spine	1	6
——— of the second anal ray	1	6
——— of the ventral	1	8

14. Chilodactylus gibbosus.

Chætodon gibbosus, *Banks.*
Cheilodactylus gibbosus, *Richards. Trans. Zool. Soc.* iii. p. 102, and *Proc. Zool. Soc.* 1850, p. 65. pl. 2. f. 3, 4.

D. $\frac{17}{33}$*. A. $\frac{3}{9}$*. L. lat. 63.

The simple rays of the pectoral of moderate length, the longest reaching to the vertical from the vent. Dorsal fin slightly notched; the fourth and fifth spines elongate, the former equal to the length of the head: in old specimens a pair of horns on the forehead and a pair of bony tubercles on the snout. A blackish longitudinal band between the dorsal and the lateral line.

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* I cannot find the numbers stated by Sir J. Richardson.

Coasts of West Australia.

a. Adult: stuffed. Type of the species.
b. Adult (female?): stuffed. Australia. Purchased of Mr. Cuming.

Immature specimens do not show either the horns or the prolonged dorsal spines; the body and tail are crossed by seven or eight blackish bands.

c, d. Half-grown. Australia. Presented by the Earl of Derby.
e. Half-grown: not good state. From the Haslar Collection.

6. MENDOSOMA*.

Mendosoma, *Gay, Hist. Chil. Zool.* ii. p. 212.

One dorsal fin, deeply notched, with twenty-two spines; the anal fin of moderate length, the caudal forked; the simple pectoral rays feeble, not exceeding the margin of the fin. Small teeth in the upper jaw only; none in the lower or on the palate. Scales of moderate size; cheeks scaly. Six branchiostegals.

Coast of Chile.

1. Mendosoma lineatum.

Gay, l. c. p. 213. lam. 5. f. 2.

D. $22 \mid \frac{1}{24}$. A. $\frac{3}{18}$.

Greenish, with brown longitudinal streaks. (*Gay.*)

Coast of Chile.

7. NEMADACTYLUS.

Nemadactylus, *Richards. Proc. Zool. Soc.* 1839, p. 98, and *Trans. Zool. Soc.* iii. p. 116.

One dorsal fin, with seventeen spines; the anal fin of moderate length; the caudal forked; one of the simple pectoral rays exceeding the fin in length. A single series of minute teeth in the jaws; no other teeth. Præorbital and præoperculum entire. Scales thin, cycloid, of moderate size. Cheeks naked. Three branchiostegals. Air-bladder? Pyloric appendages in small number.

Port Arthur (Van Diemen's Land).

1. Nemadactylus concinnus.

Richards. Trans. Zool. Soc. iii. p. 116. pl. 4. f. 2.

B. 3. D. $\frac{17}{28}$. A. $\frac{3}{15}$. L. lat. 50. Cæc. pylor. 4. Vert. 34.

Coloration uniform. The longest simple pectoral ray projecting nearly one-fourth of its length beyond the membrane. (*Rich.*)

Port Arthur.

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* 1. Mendosoma cærulescens, *Gay*, p. 215.—Chile.
2. Mendosoma fernandezianus, *Gay*, p. 216.—Juan Fernandez.

8. LATRIS*.

Latris, *Richards. Proc. Zool. Soc.* 1839, p. 98, and *Trans. Zool. Soc.* iii. p. 106.
Cheilodactylus, sp., *Richards. Ann. & Mag. Nat. Hist.* 1851, vii. p. 283.

Dorsal fin deeply notched, the spinous portion with seventeen spines; anal fin elongate; not one of the simple pectoral rays passes the margin of the fin. Teeth villiform in both the jaws; no canines. Præorbital entire; præoperculum minutely ciliated. Scales small; cheeks scaly. Six branchiostegals. Pyloric appendages in small number.

Coasts of Australia.

1. Latris hecateia.

Latris hecateia, *Richards. Proc. Zool. Soc.* 1839, p. 98, and *Trans. Zool. Soc.* iii. p. 106. tab. 6. f. 1.
Cheilodactylus hecateius, *Richards. Proc. Zool. Soc.* 1850, p. 67.

B. 6. D. 17 | $\frac{1}{36}$. A. $\frac{3}{27}$. L. lat. 110. Cæc. pyl. 4. Vert. 14/20.

The length of the head is one-fourth of the total; the lower nine pectoral rays simple. Vomerine teeth. Back and sides brown, with four straight whitish longitudinal bands.

Coasts of Van Diemen's Land.

a. Adult. Port Arthur. From the Haslar Collection. (Type of the species.)
b. Adult: very bad state. Port Arthur. From the Haslar Collection.

2. Latris ciliaris.

Latris ciliaris, *Forster, Descript. Anim.* ed. *Lichtenst.* p. 137; *Richards. Ichth. Ereb. & Terr. Fishes,* p. 37. pl. 26. f. 6, 7
Anthias ciliaris, *Bl. Schn.* p. 310.

B. 6. D. 17 | 39. A. $\frac{3}{32}$. L. lat. 84.

The length of the head is one-fifth of the total; six simple pectoral rays. Vomerine teeth none.

New Zealand.

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* 1. Sciæna lineata, *Forster.*—Cichla lineata, *Bl. Schn.* p. 342.—Cheilodactylus lineatus, *Richards. Ann. & Mag. Nat. Hist.* 1851, vii. p. 283.—New Zealand.

Fam. 10. TRIGLIDÆ*.

Cataphracti, pt., *Cuv. Règne Anim.*; *Müller, Berl. Abhandl.* 1844, p. 201.
Sclerogenidæ, pt., *Owen, Lect. Compar. Anat. Vert.* i. p. 49.
Triglidæ, pt., *Kaup in Wiegm. Archiv*, 1858, p. 329.

Form of the body oblong, compressed or subcylindrical; eyes generally lateral, the cleft of the mouth extending on the sides of the muzzle; sometimes of hideous aspect—eyes directed upwards and the cleft of the mouth subvertical. Dentition feeble; teeth in villiform bands; generally without canines. Some bones of the head armed; *suborbital ring articulated with the præoperculum.* Epidermoid productions very variable. Two separate dorsal fins, or two distinct portions of the dorsal fin†. Anal fin similarly developed as the soft dorsal. *Ventrals thoracic*, often with less than five soft rays. *Five to seven branchiostegals*; pseudobranchiæ; air-bladder often absent.

Carnivorous fishes, found in all seas,—a few only entering fresh waters. Some inhabit exclusively the fresh waters of both the Arctic regions. All live at the bottom of the water, being bad swimmers; a few are able to raise themselves into the air.

After separating the *Gasterosteidæ* from this family, as circumscribed by Cuvier, I divide them principally according to the structure of the dorsal and anal fins‡: one of the chief divisions corresponds in many characters to the *Percidæ* and *Pristipomatidæ* (*Scorpænina*), another to the *Trachinidæ* (*Cottina*). The fourth and first divisions (*Cataphracti, Heterolepidina*) have no correspondent in the preceding families, the anatomical characters of the last being very little known.

Synopsis of the Groups.

I. Body covered with ordinary scales, or naked, sometimes with some plate-like scales.

A. The spinous portion of the dorsal equally or more developed than the soft and than the anal.

Anal very long .... *a*. **Heterolepidina.**

Anal short .... *b*. **Scorpænina.**

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[*] A genus but little known has been referred to this family—Xystophorus, *Richards. Voy. Ereb. & Terr. Fishes*, p. 52. pl. 30. f. 22.

[†] Except in *Aspidophoroides*.

[‡] The distribution lately proposed by Prof. Kaup is founded on too one-sided a principle to meet with the approval of a cooler observer. The circumscription of the genera suffers very much by such a method of division; besides, wrong characters are applied to several of the genera. Müller has proposed to divide this family according to the structure of the gills; but that arrangement appears artificial, since I have observed that there is a fifth slit behind the posterior gill in some of the specimens of *Chorismodactylus multibarbatus*, whilst it is wanting in others. Moreover, the genera *Pterois* and *Scorpæna, Platycephalus* and *Cottus*, &c., would be separated from each other.

B. The spinous portion of the dorsal less developed than the soft or than the anal	*c.* **Cottina.**
II. Body completely cuirassed by bony, keeled plates or scales	*d.* **Cataphracti.**

Synopsis of the Genera.

First group: **Heterolepidina.** *Triglidæ* with the body covered with ordinary scales, and with many pyloric appendages. The two portions of the dorsal fin and the anal elongate and equally developed.

Several lateral lines	1. Chirus.
One lateral line; scales cycloid; præoperculum slightly armed	2. Ophiodon.
One lateral line; scales small, ctenoid; præoperculum not armed	3. Agrammus.
One lateral line; scales minute, with the posterior margin comb-like	4. Zaniolepis.

Second group: **Scorpænina.** *Triglidæ* with the spinous portion of the dorsal fin equally or more developed than the soft and than the anal, which is not elongate, with the body naked or covered with ordinary scales, and with the pyloric appendages in small number.

a. Body with very distinct scales.

Occiput without groove; fins not elongate; dorsal notched, with twelve or thirteen spines	5. Sebastes.
Occiput with a groove. D. 11 $\Big\vert\, \frac{1}{9-10}$. A. $\frac{3}{5}$.	6. Scorpæna.
Occiput with a groove; dorsal with seventeen spines; pectoral appendage none	7. Glyptauchen
Spines and rays of some of the fins elongate, isolated, and the latter branched; pectoral appendages none	8 Pterois.
Rays of all the fins simple; one dorsal, deeply notched.	9. Pteroidichthys.
Dorsal continuous with the caudal	10. Tænianotus.
Occiput without groove; præorbital spiniferous; dorsal with fourteen or fifteen spines; pectoral appendage none	11. Centropogon.
One pectoral appendage	12. Apistus.
Lateral line interrupted; three separate dorsal fins …	13. Enneapterygius.

β. Body with rudimentary scales, or without any.

Præorbital with an acute spine; a cleft behind the fourth gill; pectoral appendage none; dorsal with twelve to thirteen spines	14. Pentaroge.

Præorbital with an acute spine; no cleft behind the fourth gill; pectoral appendage none; dorsal with 12–17 spines, without any division	15. Tetraroge.
Head compressed; præorbital not armed; pectoral appendage none; dorsal without any division	16. Agriopus.
Præorbital with an acute spine; no cleft behind the fourth gill; pectoral appendage none; the three anterior dorsal spines forming a distinct division.	17. Prosopodasys.
Head compressed, with obtuse ridges; præorbital without a prominent spine; pectoral appendage none; the dorsal fin anteriorly with a distinct division	18. Aploactis.
Head smooth, compressed; præorbital not armed. The three anterior dorsal spines forming a distinct division, the remainder of the fin being continuous.	19. Trichopleura.
Two separate dorsals, the spinous with a distinct anterior division	20. Hemitripterus.
Præoperculum and operculum small, not covering the gill-membrane	21. Amphiprionichthys.
Head monstrous. Vomerine teeth. One dorsal. Pectoral appendage none	22. Synancidium.
Head monstrous. No vomerine teeth. One dorsal. Pectoral appendage none; anal rather short	23. Synanceia
Præorbital with a strong spine, directed downwards; two dorsals, the first with eight spines	24. Micropus.
One pectoral appendage	25. Minous.
Two pectoral appendages	26. Pelor.
Three pectoral appendages	27. Chorismodactylus.

Third group: **Cottina.** *Triglidæ* with the spinous portion of the dorsal fin less developed than the soft and than the anal, with the body naked, or covered with ordinary scales, or incompletely cuirassed with single series of plate-like scales. Pyloric appendages in small number.

Head and body compressed, without any scales or tentacles; one small recurved spine at the præopercular margin; ventrals rudimentary	28. Podabrus.
Head and body compressed, the former with tentacles, the skin of the latter with prickles; ventrals rudimentary	29. Blepsias.
Ventrals elongate, with three soft rays	30. Nautichthys.
Head not depressed, body naked. Ventrals with five soft rays, not enveloped in a thick skin; no pectoral appendages; two dorsals	31. Scorpænichthys.
Head broad, depressed, body scaleless; dorsal fins of moderate height; no palatine teeth	32. Cottus.
Head broad, depressed, body scaleless; ventrals of moderate length; palatine teeth	33. Centridermichthys.
A dorsal series of bony plates; on the sides and on the belly scattered scales; palatine teeth	34. Icelus.

A dorsal series of bony plates; oblique and separate series of small ciliated scales beneath the lateral line; no palatine teeth	35. Triglops.
Body with isolated bands of scales; dorsal fins continuous, separated by a notch	36. Hemilepidotus.
Body with isolated bands of scales; two separate dorsals.	37. Artedius.
The second dorsal very elevated	38. Ptyonotus.
One dorsal with flexible spines and rays	39. Polycaulus.
Ventrals thoracic, but situated behind the root of the pectorals; the first dorsal spine short, and isolated from the others	40. Platycephalus.
Ventrals thoracic, but situated a little before the pectorals; body incompletely covered with series of bony plate-like scales	41. Hoplichthys.
Ventrals thoracic, but situated a little before the pectorals, with five soft rays; body scaly	42. Bembras.
Three pectoral appendages; palatine teeth	43. Prionotus.
Three pectoral appendages; palatine teeth none; scales of moderate size	44. Lepidotrigla.
Three pectoral appendages; palatine teeth none; scales very small	45. Trigla.

Fourth group: **Cataphracti.** *Triglidæ* with the body completely cuirassed by bony, keeled plates or scales. Pyloric appendages in small or moderate number.

Two dorsals; no pectoral appendages; pectoral simple.	46. Agonus.
One dorsal	47. Aspidophoroides.
Two pectoral appendages	48. Peristethus.
Pectoral very long (organ for flying), with the lower portion detached and shorter	49. Dactylopterus.
Pectoral not elongate, divided into two portions by a deep notch	50. Cephalacanthus.

First Group. HETEROLEPIDINA.

Heterolepidæ, *Girard in U. S. Pacif. R. R. Exped. Fishes*, p. 41.

Triglidæ with the body covered with ordinary scales, and with many pyloric appendages. The two portions of the dorsal fin and the anal elongate and equally developed.

All these fishes, from the northern parts of the Pacific, have a common, and such a peculiar feature in their habit, that they should be comprised in one group, although it is impossible, from our scanty knowledge of their anatomy, to circumscribe it with proper characters. The increased number of the pyloric appendages, found in the species hitherto examined, and the elongate anal fin appear to me to be the characters by which, for the present, they may be separated from the *Scorpænina*,—provided that the same characters be found in the other species, as is most likely the case.

1. CHIRUS.

Chirus et Hexagrammus, *Steller.*
Labrax, *Pall. Mém. Acad. Pétersb.* ii. p. 382.
Chiropsis, *Girard, Proceed. Acad. Nat. Sc. Philad.* 1857, p. 201.

Head and body more or less compressed, elongate, covered with very small scales; several muciferous channels besides, and similar to, the usual lateral line. Bones of the head not, or very slightly armed. One dorsal, elongate, with twenty to thirty spines; anal elongate. Ventral with one spine and five rays. Small teeth in the jaws and on the vomer, and sometimes on the palatine bones. Branchiostegals six or seven. Pyloric appendages in increased number.

A genus from the North Pacific, of which we know little more than that it comprises a considerable number of species, only one of which is completely described.

1. Chirus hexagrammus.

Hexagrammus asper, (*Steller*) *Tiles. Act. Acad. Petrop.* ii. p. 340.
—— stelleri, *Tiles. ibid.* p. 335. tab. 15.
Labrax hexagrammus, *Pall. ibid.* p. 395. tab. 23. f. 3, and *Zoogr. Rosso-Asiat.* iii. p. 275; *Faun. Japon. Poiss.* p. 53. pl. 23.
Chirus hexagrammus, *Cuv. Règne Anim. Ill. Poiss.* pl. 83. f. 2; *Bleek. Verh. Bat. Gen.* xxvi. *Japan*, p. 80

B. 6. D. $\frac{20-22}{20-22}$. A. 20–22. L. lat. 105. Cæc. pylor. 13.

A skinny tentacle above each orbit. Palatine teeth none. Two muciferous channels between the lateral line and the dorsal fin, one along the base of the anal fin, and a short one above the ventral. The length of the head is $4\frac{2}{3}$ in the total; the upper maxillary reaches to below the anterior third of the orbit. Scales ciliated. A slight notch between the spinous and soft portions of the dorsal fin.

Sea of Japan; Gulf of Georgia.

a, b. Adult: stuffed. Japan.

c. Fine specimen. Gulf of Georgia (New Orcas Islands). Presented by the Lords of the Admiralty.—This specimen was received during the printing of the present sheet. I found, on dissection, that the *stomach* is a rounded, obtuse sac of moderate extent; it was filled with small crustacea. There are thirteen pyloric appendages, grouped in two clusters, of moderate length. The intestine makes an anterior and posterior convolution, and its length is three-quarters of that of the fish. The liver is large, and the greater portion is situated on the left side of the stomach. The ovaria are of moderate size, separated from each other, with a common and wide oviduct. The eggs are small. Air-bladder none; four gills, with a slit behind the fourth; pseudobranchiæ well developed.

2. Chirus decagrammus.

Labrax decagrammus, *Pall. l. c.* p. 386. pl. 22. f. 2.
Chirus decagrammus, *Richards. Faun. Bor. Amer. Pisc.* p. 99.
—— denarius, *Richards. Voy. Sulph. Fishes,* p. 78. pl. 41. f. 2.

D. $\frac{21}{25}$. A. 24.

Two muciferous channels between the lateral line and the dorsal fin, and two along the base of the anal. The length of the head is $4\frac{2}{3}$ in the total; the upper maxillary reaches to below the anterior third of the orbit. No flap above the orbit. Teeth on the vomer and the palatine bones.

Cape St. Elias; harbour of Sitka (north-west coast of America).

3. Chirus lagocephalus.

Labrax lagocephalus, *Pall. Mém. Acad. Pétersb.* ii. p. 384. pl. 22. f. 1.

D. $\frac{20}{24}$. A. 22.

Two muciferous channels above, and two below the lateral line; mouth rather small. Scales cycloid; dorsal fin deeply notched. (*Pall.*)

Kuriles.

4. Chirus octogrammus.

Labrax octogrammus, *Pall. Mém. Acad. Pétersb.* ii. p. 393. pl. 23. f. 2.

D. $\frac{19}{(?)}$. A. 24.

One muciferous channel above, and two below the lateral line. Cleft of the mouth of moderate width. Scales ciliated; dorsal fin deeply notched. Gill-membranes separated from each other by an isthmus. "Opercula cute angulata." Spotted. (*Pall.*)

Coasts of Kamtschatka· Kuriles.

5. Chirus monopterygius.

Labrax monopterygius, *Pall. Mém. Acad. Pétersb.* ii. p. 391. pl. 23. f. 1 (bad).

D. 46. A. 24.

One muciferous channel above, and two below the lateral line. Cleft of the mouth of moderate width. Scales ciliated; dorsal fin without notch; vomerine and palatine teeth; opercles slightly armed; the gill-membranes continuous under the throat. (*Pall.*)

Unalaschka.

6. Chirus constellatus.

? Labrax superciliosus, *Pall. Mém. Acad. Pétersb.* ii. p. 388. pl. 22. f. 3.
Chiropsis constellatus, *Girard in U. S. Pacif. R. R. Exped. Fishes,* p. 42. pl. 19.

B. 6. D. 21 | 25. A. 24.

Caudal fin subconcave posteriorly; anal rounded exteriorly. Scales on the middle of the flanks conspicuously larger than elsewhere. Greenish-brown, with groups of black dots on the anterior part of the body and on the sides of the head; pectorals densely dotted with black. A flap above each orbit. Palatine and vomerine teeth. (*Gir.*)

West coast of North America.

Chirus guttatus, Girard, Proc. Acad. Nat. Sc. Philad. 1854, p. 132, or *Chiropsis guttatus*, Gir., U. S. Pacif. R. R. Exped. Fishes, p. 44, pl. 20. f. 5–8, appears to be closely allied to, or identical with, the above species. It is also possible that this species is the same as *Labrax decagrammus*, Pall., or *Chirus denarius*, Rich., both species being founded on dried skins, in which the tentacle above the orbit may have been overlooked.

7. Chirus nebulosus.

Chiropsis nebulosus, *Girard, U. S. Pacif. R. R. Exped. Fishes*, p. 45.

B. 7. D. 28 | 19. A. 25.

Caudal subconcave posteriorly; the lower portion of the cheeks and the opercular apparatus scaleless; base of the anal longer than of the soft dorsal. Above black, beneath olive. Five lateral lines on each side. (*Gir.*)

Fort Steilacoom, Puget's Sound.

8. Chirus pictus.

Chirus pictus, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 132.
Grystes lineatus, *Ayres, Proc. Calif. Acad. Nat. Sc.* i. p. 9.
Chiropsis pictus, *Girard, U. S. Pacif. R. R. Exped. Fishes*, p. 43. pl. 20. f. 1–4.

B. 6. D. 19 | 23. A. 21.

Caudal fin subtruncated posteriorly. Scales of more uniform size than in *Ch. constellatus*. Dark brown, with numerous vermilion spots, bordered with black, on the sides and the lower fins. Palatine and vomerine teeth; a skinny flap above each orbit; scales ctenoid. (*Gir.*)

Coast of California.

2. OPHIODON.

Ophiodon, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 133.
Oplopoma, *Girard, l. c.* 1856, p. 135.

Body and head elongate and slightly compressed, covered with very small cycloid scales. Præoperculum slightly armed. Two dorsals, more or less contiguous, the first with more than twenty spines; anal elongate; ventrals thoracic. Teeth in the jaws, on the vomer, and the palatine bones. Six branchiostegals.

Coasts of California.

1. Ophiodon pantherinus.

Oplopoma pantherina (*quære* Hoplopoma pantherinum), *Girard, l. c.*, and *U. S. Pacif. R. R. Exped. Fishes*, p. 46. pl. 18. f. 1–3.

D. 24 | $\frac{1}{22}$. A. 22. V. 1/5.

The dorsal fins united at the base only; a small skinny flap above the orbit; the upper maxillary reaches to beyond the vertical from the posterior margin of the orbit. Brown: head and body spotted with black. (*Gir.*)

Cape Flattery, W. coast of N. America.

2. **Ophiodon elongatus.**

Girard, Proc. Acad. Nat. Sc. Philad. 1854, p. 133, and *U. S. Pacif. R. R. Exped. Fishes,* p. 48. pl. 18. f. 4–7.

D. 26 | 22. A. 24. V. 1/5.

The dorsal fins separated from each other by a slight notch; no flap above the orbit. The upper maxillary reaches to the vertical from the posterior margin of the orbit. Brown, spotted all over with blackish. (*Gir.*)

Coasts of California.

3. AGRAMMUS.

Labrax, sp., *Temm. & Schleg. Faun. Japon. Poiss.* p. 56.

Head and body compressed, rather elongate, with small ctenoid scales; a single lateral line. Bones of the head not armed. One elongate dorsal, with seventeen or eighteen spines; anal elongate; ventral with one spine and five rays. Small teeth in the jaws and on the vomer; none on the palatines. No flap above the orbit. Branchiostegals six. Pyloric appendages?

Sea of Japan.

1. **Agrammus schlegelii.**

Labrax agrammus, *Temm. & Schleg. l. c.*

D. $\frac{17-18}{20-21}$. A. 18–20. L. lat. 90.

The length of the head is one-fifth of the total. The upper maxillary reaches beyond the vertical from the anterior margin of the eye. Brownish, marbled or irregularly banded with darker.

Sea of Japan.

a. Adult: skin, in spirits. Japan.

4. ZANIOLEPIS.

Zaniodermis, *Girard in Proc. Acad. Nat. Sc. Philad.* 1857, p. 202.
Zaniolepis, *Girard in U. S. Pacif. R. R. Exped. Fishes,* p. 73.

Head and body compressed, slightly elongate; the upper surface of the head spineless. Præoperculum armed. Scales minute, imbedded in the epidermis, with the posterior margin comb-like and projecting from the skin. One dorsal; the spinous portion and the anal much longer than the soft. The anterior part of the spinous dorsal elevated. Ventrals thoracic. Card-like teeth in the jaws, on the vomer and the palatine bones. Branchiostegals six.

Pacific coasts of the United States.

Nothing has been made known of the anatomy of this fish, but it appears to me to have some relation to the genera of this group.

1. Zaniolepis latipinnis.

Girard, Proc. Acad. Nat. Sc. Philad. 1857, p. 202, and *U. S. Pacif. R. R. Exped. Fishes*, p. 73. pl. 17. f. 5, 6.

B. 6. D. 21 | 13. A. $\frac{3}{17}$. V. 1/5.

The height of the body equals the length of the head, and is one-fifth of the total. The first dorsal spine produced; the second very elongate. Yellowish-brown; fins spotted with black. (*Gir.*)

Fort Steilacoom, Puget's Sound.

Second Group. SCORPÆNINA.

Triglidæ with the spinous portion of the dorsal equally or more developed than the soft and than the anal, which is not elongate, with the body naked or covered with ordinary scales. Pyloric appendages in small number.

5. SEBASTES*.

Sebastes, *Cuv. & Val.* iv. p. 326.

Head and body compressed, above scaly to, or beyond, the orbits, *without groove on the occiput*, generally with a few small spines; præoperculum armed; body covered with scales of moderate or small size; no skinny appendages. Fins not elongate: one dorsal, separated by a notch in a spinous and soft portion, with twelve or thirteen spines; the anal with three. No pectoral appendages. Villiform teeth in the jaws, on the vomer, and generally on the palatine bones. Seven branchiostegals. Air-bladder mostly present; pyloric appendages in moderate or small number.

Inhabitants of nearly all the seas; but not yet found on the Atlantic shores of Tropical America and on the east coast of Africa.

1. Sebastes norwegicus.

Perca marina, *L. Syst. Nat.* i. p. 483; *Pennant, Brit. Zool.* iii. p. 226, pl. 48 (lower figure).
Cyprinus pelagicus, *L. Faun. Suec.* p. 320.
Karfe, *Olafsen, Island*, i. p. 191, ii. p. 208. tab. 29.
Perca norwegica, *Müller, Zool. Dan.* p. 46; *Ascan. Icon.* ii. tab. 16; *Fabric. Faun. Grönl.* p. 167.
Sparus erythrinus, *Müll. Zool. Dan.* p. 45 (not *L.*).
Holocentrus norwegicus, *Lacép.* iv. p. 390.
—— sanguineus, *Faber, Fische Islands*, p. 126.
Sebastes norwegicus, *Cuv. & Val.* iv. p. 327. pl. 87; *Yarrell, Brit. Fishes*, i. p. 87; *Richards. Faun. Bor. Amer. Fishes*, p. 52; *Storer, Rep. Mass.* p. 26; *Dekay, New York Fauna, Fishes*, p. 60. pl. 4. f 2; *Kröyer, Danm. Fisk.*, and *Naturhist. Tidsskr.* 1844–45, i. p. 270.
—— septentrionalis, *Gaim. Voy. Isl. & Groënl. Poiss.* pl. 9. upper fig.

D. $\frac{15}{15}$. A. $\frac{3}{8-9}$. L. lat. 75. Cæc. pylor. 9. Vert. 12/19.

The height of the body is $3\frac{3}{4}$ in the total length, the length of the head $3\frac{1}{4}$; the upper surface of the head is flat, without prominent spines; the width of the space between the eyes is one-fifth of the length of the head. The upper maxillary reaches to the vertical from the centre of the eye. The fourth to the ninth dorsal spines are nearly equal in length, and one-fourth the length of the head. The third anal spine is the longest. Uniform red.

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* 1. Sebastes vachellii, *Richards. Ichth. China*, p. 214.—Canton.
2. —— auriculatus, *Gir. Proc. Acad. Nat. Sc. Philad.* 1854, pp. 131, 146, and *U. S. Pacif. R. R. Exped. Fishes*, p. 80.—California.

Arctic Seas, extending southwards to the coasts of Norway, Scotland, and New York.

a. Adult. N. coast of Norway. Purchased of Mr. Brandt.
b. Adult. Newcastle. Presented by Dr. Johnston.
c. Young. 72° N. Lat. Presented by Capt. Sir J. Ross.
d–g. Large specimens: stuffed. Greenland. Presented by the Zoological Society.

2. Sebastes viviparus.

Kröyer, Naturhist. Tidsskr. 1844–45, i. p. 275; *Gaim. Voy. Scandin. Zool. Poiss.* pl. 6.

D. $\frac{15}{13\text{–}14}$. A. $\frac{3}{6\text{–}8}$.

The length of the head is one-third of the total, and rather more than the height of the body. The width of the space between the eyes is much less than the diameter of the eye, which equals the extent of the snout, and is one-third of the length of the head. Reddish, with a large blackish blotch on the operculum; generally spotted with brown, sometimes entirely brown. (*Kröyer.*)

Arctic Seas.

a. Young: not good state.

3. Sebastes capensis.

Gronov. Zoophyl. no. 293. p. 88.
Scorpæna capensis, *L. Gm.* iii. p. 1219.
—— africana, *Lacép.* iii. p. 266.
Sebastes capensis, *Cuv. & Val.* iv. p. 341; *Quoy & Gaim. Astrol. Poiss.* p. 690. pl. 11. f. 3; *Smith, Ill. S. Afr. Pisc.* pl. 22. f. 1.
? Sebastes maculatus, *Smith, l. c.* f. 2 (not *Cuv. & Val.* nor *Richards.*).
Perca afra, *Gronov. Syst. ed. Gray*, p. 113.

D. 12 | $\frac{1}{13}$. A. $\frac{3}{6}$. L. lat. 70. Cæc. pylor. 11.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head three times. The upper surface of the head is rather flat, with low ridges and some depressed spines behind the orbit. The width of the space between the orbits is one-sixth of the length of the head. The upper maxillary reaches beyond the vertical from the centre of the eye. The third to the seventh dorsal spines are nearly equal in length, and one-third the length of the head. The second of the anal is the longest. Reddish.

Cape Seas.

a. Adult: bad state. Cape Seas. Purchased of Mr. Frank.
b. Adult: stuffed. Cape Seas. Purchased of Sir A. Smith.

c. Adult: stuffed. Cape Seas.
d. Adult: skin: bad state. Presented by the Zoological Society.
e. Adult: skin: bad state.
f. Adult: skin. From Gronov's Collection.

4. Sebastes inermis.

Sebastes inermis, *Cuv. & Val.* iv. p. 346; *Faun. Japon. Poiss.* p. 47. pl. 21. f. 3, 4.
—— caurinus, *Richards. Voy. Sulph. Ichth.* p. 77. pl. 41. f. 1.

$$\text{D. } 12 \left| \frac{1}{13\,(-15)} \right. \quad \text{A. } \frac{3}{6}. \quad \text{L. lat. } 60.$$

The height of the body equals the length of the head, and is $3\frac{1}{4}$ in the total. The upper surface of the head is flat, with low ridges and some depressed spines behind the orbit. The width of the space between the orbits is one-sixth of the length of the head. The upper maxillary reaches beyond the vertical from the centre of the eye. The fourth and fifth dorsal spines are the longest, longer than those of the anal, and nearly half the length of the head. Uniform brownish.

Sea of Japan; north-west coast of America.

a. Adult. Japan. Purchased of Mr. Frank.

5. Sebastes pachycephalus.

Temm. & Schleg. Faun. Japon. Poiss. p. 47. pl. 20. f. 3; *Richards. Ichthyol. Chin.* p. 214.

$$\text{D. } \frac{13}{12}. \quad \text{A. } \frac{3}{6}. \quad \text{L. lat. } 55.$$

The superciliary and occipital ridges are enveloped in a thick skin; the upper surface of the head rather flat, with the spines not prominent; the space between the orbits is scaly, rather concave, and its width one-eighth of the length of the head. The upper maxillary reaches to the vertical from the posterior margin of the eye. The fourth to ninth dorsal spines are nearly equal in length, about one-third the length of the head, and equal to the second anal spine. Brown, spotted with darker; fins crimson, spotted with brown.

Japanese and Chinese Seas.

a. Adult: stuffed. Japan. Purchased of Mr. Frank.
b. Adult: skin, in spirits. Purchased of Mr. Frank.

6. Sebastes ventricosus.

Temm. & Schleg. Faun. Japon. Poiss. p. 48. pl. 20. f. 1, 2; *Bleek. Verhand. Batav. Genootsch.* xxvi. p. 80.

$$\text{D. } 12 \left| \frac{1}{14-15} \right. \quad \text{A. } \frac{3}{7}. \quad \text{L. lat. } 53.$$

The upper surface of the head is flat, with the ridges and spines very feeble; the width of the space between the eyes is one-fifth of the length of the head. The lower jaw acutely prominent; the upper maxillary reaches to the vertical from the centre of the eye. The fourth dorsal spine is the longest, nearly one-half the length of the head, and exceeds the third of the anal much in length. Brownish.

Sea of Japan.

a, b. Adult: stuffed. Japan.
c. Half-grown: stuffed. Japan. Purchased of Mr. Frank.

7. Sebastes melanops.

Sebastes melanops, *Girard, Proc. Acad. Nat. Sc. Philad.* 1856, p. 135, and *U. S. Pacif. R. R. Exped. Fishes*, p. 81.
—— variabilis, *Ayres, Proc. Calif. Acad. Nat. Sc.* i. 1854, p. 7, and *Proc. Bost. Soc. Nat. Hist.* v. 1855, p. 9.

$$D. 12 \Big| \frac{1}{15\,(16)}. \quad A. \frac{3}{8}.$$

The upper surface of the head spineless. The length of the head is two-sevenths of the total. The lower jaw very prominent; the upper maxillary reaches to a vertical drawn anteriorly to the posterior margin of the orbit. The sixth and seventh dorsal spines are the longest. Brownish, sides spotted with black; fins uniform.

Cape Flattery, W. T., and Astoria, Oregon.

8. Sebastes paucispinis.

Ayres, Proc. Calif. Acad. Nat. Sc. 1854, p. 6, and *Proc. Bost. Soc. Nat. Hist.* 1854, p. 94; *Girard, U. S. Pacif. R. R. Exped. Fishes*, p. 83. pl. 22*a*. f. 1–4.

$$D. \frac{13}{14}. \quad A. \frac{3}{9}.$$

Scales small. The length of the head is one-third of the total. The upper surface of the head with the ridges and spines very feeble. The lower jaw acutely prominent; the upper maxillary reaches beyond the vertical from the anterior margin of the eye. Brownish. (*Gir.*)

Coast of California.

9. Sebastes rosaceus.

Sebastes rosaceus, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 146, and *U. S. Pacif. R. R. Exped. Fishes*, p. 78. pl. 21.
—— ruber, *Ayres, Proc. Calif. Acad. Nat. Sc.* 1854, p. 7, and *Proc. Bost. Soc. Nat. Hist.* 1855, p. 97.

$$D. \frac{13}{13}. \quad A. \frac{3}{7}.$$

The height of the body is one-third of the total length, and nearly equal to the length of the head. The upper surface of the head with acute ridges and small spines. The lower jaw prominent; the upper maxillary reaches to the vertical from the centre of the eye. The third dorsal spine (according to the figure) is the longest, $2\frac{1}{2}$ in the length of the head; the second of the anal fin is the longest, but much shorter than the third of the dorsal. Uniform reddish. (*Gir.*)

Coast of California.

10. Sebastes variabilis.

Perca variabilis, *Pallas, Zoogr. Ross.* iii. p. 241.
Epinephelus ciliatus, *Tiles. Mém. Acad. Sci. St. Pétersb.* iv. p. 474. pl. 16. f. 1–6.
Sebastes variabilis, *Cuv. & Val.* iv. p. 347.

D. $\frac{13}{15}$. A. $\frac{3}{9}$.

The length of the head is $3\frac{3}{5}$ in the total. Neither ridges nor spines on the upper surface of the head; five obtuse præopercular spines. Brownish.

Aleutian Islands.

11. Sebastes dactylopterus.

Scorpæna dactyloptera, *De la Roche, Ann. Mus.* xiii. pl. 22. f. 2; *Risso, Ichth. Nice*, p. 186, and *Eur. Mérid.* iii. p. 369.
? Scorpæna malabarica, *Bl. Schn.* p. 194.
Sebastes imperialis, *Cuv. & Val.* iv. p. 336; *Lowe, Trans. Zool. Soc.* ii. p. 175; *Guichen. Explor. Algér. Poiss.* p. 42; *Kröyer, Naturhist. Tidsskr.* 1844–45, i. p. 281.

D. 11 $\left|\frac{1}{12}\right.$. A. $\frac{3}{5}$. L. lat. 55. Cæc. pylor. 5 (7 *Lowe*). Vert. 10/14.

The height of the body is $3\frac{3}{4}$ in the total length, the length of the head nearly $3\frac{1}{4}$. The space between the eyes is concave, with two ridges, narrow, its width being one-ninth of the length of the head. Vertex with prominent spines. Tongue distinctly free anteriorly. The upper maxillary reaches behind the vertical from the centre of the eye. The third and fourth dorsal spines are the longest, one-half the length of the head; the second of the anal fin is the longest. Five præopercular spines, the second of which is the most prominent. Red, spotted or banded with brown; pharynx black.

Mediterranean; Madeira.

a. Adult. Madeira. Presented by the Rev. R. T. Lowe.
b. Adult. Madeira. Presented by Sir A. Smith.
c. Half-grown: skin. From Mr. Yarrell's Collection.

12. Sebastes nematophthalmus.

D. 11 $\left|\frac{1}{10}\right.$. A. $\frac{3}{5}$. L. lat. 40–41.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head three times. The space between the eyes is concave, with two ridges, narrow, its width being one-eleventh of the length of the head. Vertex and suborbital ridge, and in younger individuals the præorbital, with prominent spines. Tongue distinctly free anteriorly. The upper maxillary reaches to the vertical from the centre of the eye; a long filament above each orbit. The third and fourth dorsal spines are the longest, their length being $2\frac{3}{5}$ in that of the hea the second of the anal fin longer and stronger than the third. Three præopercular spines. Uniform red.

Caribbean Sea.

a. Adult: stuffed. (Ile de France?) From Dr. Janvier's Collection.
b. Half-grown. West Indies. Presented by Sir R. Schomburgk.

Description.—The greatest depth of the body is below the fifth dorsal spine, where it is contained $3\frac{1}{2}$ in the total length. The outlines of the form of the body resemble very much those of the common Perch, the dorsal line being most arched at the highest point of the body. The length of the head is one-third of the total. The eye is placed high up the sides, slightly interfering with the upper outline of the head; its horizontal diameter is rather shorter than the snout, and one-fourth of the length of the head.

The intermaxillaries are styliform, and armed, like the dentary and palatine bones, with a rather narrow band of villiform teeth. The band of the vomerine teeth is angularly bent, and produced forwards at the angle. The maxillaries are styliform at the superior extremity and moderately dilated at the inferior. Scales cover the head to the posterior angle of the orbit superiorly, and to the præorbital and the angle of the mouth laterally. The spines are very acute and prominent in the younger of the specimens, and more obtuse in the older one. There are two turbinal spines; on each side of the occiput a series of five spines between the orbit and the nape of the neck; two between the eye and the scapula. The præorbital is armed with two strong and recurved spines at the inferior margin; the infraorbital ridge with three. The præopercular margin is rounded, and provided with four spines, the uppermost and strongest of which is situated opposite to the extremity of the infraorbital ridge; the operculum with two flat spines; there is, finally, another pair at the throat. The only skinny appendage in this species is a long, slender, tapering filament above the posterior angle of the orbit.

The dorsal fin commences immediately behind the vertical from the suprascapula, its distance from the occiput equalling the length of the first spine, which is about half the length of the second; the third and fourth are the longest, $2\frac{3}{5}$ in the length of the head; the following gradually decrease in length to the eleventh, which equals the first; the twelfth spine is much longer again, apparently belonging to the soft portion of the fin, which is supported by it; the soft portion has the margin rounded, is very little higher than the spinous, and posteriorly fixed to the back of the tail by a membrane. Caudal subtruncated. The origin of the anal falls vertically somewhat behind that of the soft dorsal; its second spine is strong, rather longer than the third of the dorsal fin, and has a longitudinal groove. The pectoral fin reaches to the anal, the ventral to the vent.

The scales are of moderate size and rather irregularly arranged; there can be counted, however, forty transverse rows.

The colour appears to have been uniform red; but the fish is now of the same whitish colour which such fishes usually present if preserved in spirits.

One of the fishes formed part of a collection made by Sir R Schomburgk in the West Indies, presented by him to the Museum, and there is no doubt as to the locality whence it was originally obtained. The other specimen, however, from Dr. Janvier's Collection, is marked as being brought from the Ile de France. I have not the least doubt about the specific identity of the two specimens; but if there be no mistake in the statement of the locality of the latter, this species would offer a singular example in the genus, the Indian forms of which are specifically different from those of the Atlantic.

	inches.	lines.
Total length of the smaller specimen	6	7
Height of the body	1	11
Length of the head	2	3
Width between the eyes	0	2½
Diameter of the eye	0	7
Length of the third dorsal spine	0	10
Total length of the larger specimen	14	0

13. Sebastes maculatus.

Cuv. & Val. iv. p. 343 (not *Smith*).

$D. \frac{12}{13}. \quad A. \frac{3}{6}.$

Closely allied to *S. dactylopterus* and *S. percoides*. The interocular space narrow, concave; the dorsal spines elevated. Reddish; a brown spot behind each dorsal spine. (*Cuv.*)

Cape Seas.

No air-bladder (?).

14. Sebastes percoides.

Scorpæna percoides, *Solander*.

Sebastes maculatus, *Richards. Trans. Zool. Soc.* iii. p. 93 (not *Cuv.* or *Smith*).

—— percoides, *Richards. Ann. Nat. Hist.* 1842, ix. p. 384, and *Voy. Ereb. & Terr. Fishes*, p. 23. pl. 15. f. 1, 2.

$D. 11 \mid \frac{1}{12}. \quad A. \frac{3}{5}. \quad L. lat. 60–65.$

The height of the body is $3\frac{1}{2}$ in the total length, and the length of the head $3\frac{1}{5}$. The space between the eyes is concave, with two ridges, narrow, its width being one-ninth the length of the head. The snout is shorter than the diameter of the eye, which is $3\frac{1}{3}$ in the length of the head. Vertex with prominent spines. Tongue free anteriorly; the upper maxillary reaches behind the vertical from the centre of the eye. The third and fourth dorsal spines are the longest, $2\frac{1}{2}$ in the length of the head, and longer than the anal spines. Reddish, with five brown cross-bands; pharynx black.

New Zealand; Van Diemen's Land; Port Jackson.

a. Adult: not good state. Port Arthur. Presented by Sir J. Richardson.
b. Adult: stuffed. Port Jackson.
c. Adult: bad state. Tasmania. Presented by the College of Surgeons.
d. Adult: stuffed: bad state. Australia.
e. Adult. From the Haslar Collection.
f. Adult. Old Collection, as *Scorpæna macrophthalma*.

15. Sebastes maderensis.

Scorpæna madurensis, *Cuv. & Val.* ix. p. 463.
Sebastes maderensis, *Lowe, Trans. Zool. Soc.* ii. p. 176.

$D.\ 11 \mid \frac{1}{10}.\quad A.\ \frac{3}{5}.$ L. lat. 50. Cæc. pylor. 7. Vert. 24.

The height of the body is $3\frac{3}{4}$ in the total length, the length of the head nearly $3\frac{1}{4}$. The space between the eyes is concave, with two low ridges, and its width is about one-seventh of the length of the head. Vertex with prominent spines. No free tongue; the upper maxillary reaches behind the vertical from the centre of the eye. The fourth dorsal spine is the longest, one-half the length of the head; the second of the anal fin is still longer. Five præopercular spines, the uppermost of which is the strongest; coracoid with two spines. Reddish-olive, with five rather irregular, brown, vertical bars; axil with reddish-white spots; pharynx colourless.

Sea of Madeira.

a. Adult. Madeira. Presented by the Rev. R. T. Lowe.
b. Adult: skeleton. Madeira. Presented by — Johnson, Esq.
c. Adult. Madeira. Presented by the Rev. H. H. Methuen.
d. Adult: stuffed. Madeira. From the Collection of the Zoological Society.
e. Adult. Presented by the Lords of the Admiralty.

The *skeleton* appears to be very much like that of the following species, *Sebastes kuhlii*. There are twenty-four vertebræ; the first interhæmal is suspended on the hæmal spines of the eighth and ninth vertebræ.

16. Sebastes kuhlii.

Scorpæna kuhlii, *Bowd. Exc. in Mad.* p. 123.
Sebastes kuhlii, *Lowe, Syn. Fish. Mad.* p. 176, and *Fishes of Madeira*, p. 115.

$D.\ 11 \mid \frac{1}{10}.\quad A.\ \frac{3}{5}$ L. lat. 60. Vert. 10/14.

The height of the body is $3\frac{2}{3}$ in the total length, the length of the head three times. The space between the eyes is slightly concave, with two low ridges, and its width is about one-eleventh of the length of the head. Snout subelongated, vertex with prominent spines. Tongue free anteriorly; the upper maxillary reaches beyond the vertical from the centre of the eye. The second and third dorsal spines are elongate, and one-half the length of the head, even longer than the second of the anal; generally none of the rays of the pectoral branched; coracoid with a single spine. Red, with small brownish spots; pharynx colourless.

Sea of Madeira; Canary Islands.

a. Adult: stuffed. Santa Cruz. (Teneriffe.)
b. Adult: skin. Santa Cruz. (Teneriffe.)
c. Adult. Madeira. From the Haslar Collection.
d. Adult: skeleton. Madeira. Presented by Sir A. Smith.
e. Adult. Old Collection, as *Scorpæna chorista*.

Skeleton.—All the bones of the skull are thin and transparent. The upper maxillary is styliform in its anterior half, and spatuliform in its posterior; the intermaxillary has a broad plate-like process on the descending branch, which is much longer than the posterior processes. There is a wide free space between the dentary and articular bones of the mandibula, and the former has an ovate shallow cavity at its outer side; pores and a muciferous channel are scarcely visible. The toothed portion of the palatine bones is situated in a horizontal direction, the posterior part being slightly bent downwards. The præoperculum is arched, and furnished with a distinct muciferous channel; two triangular spines, pointing downwards, are found at the lower limb, whilst a stronger and rather larger one is situated opposite to the articulation of the infraorbital with the præoperculum; a very small spine is situated between the latter spine and the next inferior one. The operculum forms an irregular pentagon, with three slight radiating ridges, visible interiorly and exteriorly; the suboperculum and interoperculum are oblong, the former with an anterior process directed upwards, for the junction with the operculum.

The turbinal bones are lost; the præorbital has two spines at the inferior margin, pointing backwards; the infraorbital has a longitudinal ridge, with three small spines; the posterior portion of the infraorbital ring is very narrow. The ethmoid is intercalated between the principal frontal bones, which diverge anteriorly, and is armed with a pair of small spines, pointing forwards. The anterior frontals form the anterior part of the orbit, and terminate superiorly in a strong spine. The principal frontal bones are rather narrow and elongate, anteriorly transformed into a muciferous channel, each with a small slit between the orbits; their orbital margin is armed with three spines. The crown and occipital region are flat on each side, with a slight ridge, each of which has two depressed spines. The basal portion of the brain-capsule has an ovate-elongate protuberance on each side; the basisphenoid, anteriorly very narrow and without ridge, has a small opening behind the occipital joint.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·2. The third neural is the strongest, supporting the interneurals of the second and third dorsal spines. The hæmapophyses of the last four abdominal vertebræ are much developed, and on the last is suspended the first interhæmal spine, which is very strong, and equal in length to the first seven vertebræ.

All the teeth are in villiform bands, those of the intermaxillary, of the mandibula, and of the palatine bones reaching to the extremity of the bones. The vomerine band is rectangularly bent. The upper pharyngeal teeth form several separate rounded patches.

17. Sebastes bougainvillii.

Cuv. & Val. iv. p. 349.

D. $11 \mid \frac{1}{8}$. A. $\frac{3}{5}$. Cæc. pylor. 4.

The length of the snout is one-half the diameter of the eye, which is $2\frac{1}{3}$ in the length of the head. The spines of the head very prominent; there are eight spines along the superciliary edge. The spinous dorsal elevated; the third spine as high as the body, but shorter than the second of the anal. Nearly all the pectoral rays branched. (*Cuv.*)

Indian Ocean.

No air-bladder.

18. Sebastes fasciatus.

Sebastes fasciatus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 146, and *U. S. Pacif. R. R. Exped. Fishes*, p. 79. pl. 22.

—— nebulosus, *Ayres, Proc. Calif. Acad. Nat. Sc.* 1854, p. 5, and *Proc. Bost. Soc. Nat. Hist.* 1854, p. 96.

D. $\frac{13}{13}$. A. $\frac{3}{7}$.

The height of the body equals the length of the head, and is rather more than one-third of the total. The upper surface of the head is provided with large spinous ridges. The lower jaw is slightly prominent; the upper maxillary reaches nearly to the vertical from the posterior margin of the eye. The fourth dorsal spine (according to the figure) is the longest, more than half the length of the head, and much longer than the third and second of the anal, which are nearly equal to each other. Greenish-yellow: head, body and fins irregularly spotted with purplish-black and whitish. (*Gir.*)

Coast of California.

19. Sebastes marmoratus.

Sebastes marmoratus, *Cuv. & Val.* iv. p. 345; *Faun. Japon. Poiss.* p. 46. pl. 21. f. 1, 2.

Holocentrus albo-fasciatus, *Lacép.* iv. p. 372.

Sebnstes albo-fasciatus, *Cuv. & Val.* iv. p. 344.

—— sinensis, *M'Clell. Calc. Journ. Nat. Hist.* iv. p. 397. pl. 21. f. 3 (*cfr. Richards. Ichth. Chin.* p. 215).

D. $11 \mid \frac{1}{12}$. A. $\frac{3}{5}$. L. lat. 85.

The height of the body is $3\frac{2}{3}$ in the total length, the length of the head three times; the space between the eyes is concave, and provided with a groove along the middle; vertex with prominent spines. The fourth and fifth dorsal spines are the longest, one-third the length of the head, and much shorter and more feeble than the second of the anal. Brownish-red, marbled with darker; fins dotted with white.

Japanese and Chinese Seas.

a. Large specimen: stuffed. Japan.
b. Half-grown. China.
c. Adult: bad state. From Mr. Frank's Collection.

20. **Sebastes oculatus.**

Cuv. & Val. ix. p. 466; *Jenyns, Zool. Beagle, Fishes,* p. 37; *Gay, Hist. Chil. Zool.* ii. p. 178; *Cuv. Règne Anim. Ill. Poiss.* pl. 23. f. 3.

D. $\frac{13}{14}$. A. $\frac{3}{6}$.

The height of the body is $3\frac{3}{4}$ in the entire length, the length of the head three times. The interocular space equals rather more than half the diameter of the eye, and is concave, with two longitudinal ridges. The crown of the head with prominent spines; the second anal spine longest and strongest. Red: back brownish (with four round red spots). (*Jen.*)

Valparaiso.

21. **Sebastes strongensis.**

Scorpæna strongia, *Cuv. & Val.* iv. p. 323; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 688 (descript. bad), pl. 11. f. 2; *Less. Voy. Duperr. Zool. Poiss.* p. 213.
—— cyanostigma, *Bleeker, Buru,* p. 400.

D. $11 \big| \frac{1}{9}$. A. $\frac{3}{5}$. L. lat. 45.

The height of the body is $3\frac{3}{5}$ in the total length, the length of the head three times. Vertex, temple, and operculum scaly. The width of the space between the orbits is less than one-half of their diameter, which is $2\frac{1}{3}$ to three times in the length of the head. The snout is shorter than the eye; no groove below the eye; jaws nearly equal in front; no conspicuous skinny flaps. Præorbital with very distinct spines, one of which points downwards and crosses the maxillary. The spinous portion of the dorsal higher than the soft; the spines of the anal strong, the middle one being the longest. Brownish, clouded with rose-coloured, and dotted all over with bluish-white.

East Indian Archipelago; Polynesia.

a. Half-grown. From Mr. Macgillivray's Collection.
b. Young: bad state. Amboyna. Purchased of Mr. Frank.
c. Young: not good state. Amboyna. Purchased of Mr. Frank.

22. **Sebastes longiceps.**

Richards. Ichth. Chin. p. 214.

D. $\frac{13}{10}$. A. $\frac{2}{6}$.

The length of the head is $2\frac{1}{2}$ in the total. There are three small teeth on the slightly raised upper edge of the orbit, four or five minute serratures in its middle part, and three larger jagged teeth at its posterior corner. The two low, rounded interocular ridges are separated from each other by a narrow mesial furrow, and the whole space between the eyes does not exceed two-thirds of the diameter of the orbit. The ridge which flanks the top of the cranium is a regular saw with five teeth. A low, thin, irregularly incised edge crests the infraorbitar ridge. Small scales cover the top of the head to the nostrils. (*Rich.*)

Discovered by Sir J. Richardson in insect-boxes from China.

23. Sebastes serrulatus.

Richards. Ichth. Chin. p. 215.

$$\text{D. } 12 \left| \frac{1}{11}. \quad \text{A. } \frac{3}{5}. \right.$$

Head with very low, thin, and serrated crests. A low double crest skirts the upper edge of the orbit, and is followed on each side of the crown by a rather higher single one. The second infraorbital, which crosses the cheek, shows two thin, finely serrated crests, that include a rugose disk. The præopercular margin is serrated throughout; a very minute spine at its angle, and clusters of spinous points on the usual sites of the four angular corners (?). Each limb of the lower jaw is traversed by three serrated crests. The operculum ends in a minute spinous point. The interorbitar space exceeds half the diameter of the orbit in breadth, and is scaly between the ridges. Palatine bones toothless. (*Rich.*)

Discovered by Sir J. Richardson in an insect-box from China.

24. Sebastes minutus.

Cuv. & Val. iv. p. 348.

$$\text{D. } \frac{12}{13}. \quad \text{Cæc. pylor. } 3.$$

Lateral line rough. Spines of the head very prominent. Reddish-brown, marbled with darker. (*Cuv.*)

Palatine bones?

Polynesia.

25. Sebastes polylepis.

Scorpæna polylepis, *Bleek. Natuurk. Tydschr. Nederl. Indië*, 1851, ii. p. 173.

$$\text{D. } 12 \left| \frac{1}{9}. \quad \text{A. } \frac{3}{5}. \quad \text{L. lat. } 35. \right.$$

Palatine teeth none. The height of the body is one-fourth of the total length, the length of the head one-third; cheeks and operculum entirely scaly. The diameter of the eye is 3 to $3\frac{1}{2}$ in the length of the head, and the distance between the eyes equals one-half their diameter. No groove below the eye. Præorbital with the spines obtuse; prominent spines on the crown of the head; no skinny appendages. The spinous dorsal half as high as the body. Brown, marbled and variegated with darker.

Seas of Amboyna and Sumatra.

a, b. Half-grown. Purchased of Mr. Frank.
c. Young. Amboyna. From Mr. Frank's Collection.
d–f. Young. East Indies. Presented by Captain Sir E. Belcher.

6. SCORPÆNA*.

Scorpæna, *Artedi, Genera,* p. 47; *Cuv. & Val.* iv. p. 286.
Scorpæna et Scorpænopsis, *Heck. Ann. Wien. Mus.* ii. 1840, p. 158.
Scorpæna et Scorpænichthys, (not *Girard*) *Bleek. Boeroe,* p. 402.

Head large, slightly compressed, *with a naked groove on the occiput,* armed with spines, and generally with skinny flaps; body covered with scales of moderate or rather small size, and generally with skinny appendages. One dorsal, more or less deeply notched, generally with the formula $11 \mid \frac{1}{9\text{–}10}$; anal $\frac{3}{5}$. Ventrals thoracic; pectorals large, rounded; no pectoral appendages. Villiform teeth in the jaws, on the vomer, and generally on the palatine bones. Seven branchiostegals. Air-bladder none; pyloric appendages in moderate number.

All the Tropical Seas, extending northwards into the Mediterranean and along the Atlantic coasts of the United States.

A. Species with palatine teeth.

1. Scorpæna porcus.

? Scorpæna, *Salv.* f. 201.
Scorpæna, no. 1, *Artedi, Genera,* p. 47.
—— porcus, *L. Syst.* i. p. 452; *L. Gm.* i. p. 1214; *Brünn. Ichthyol. Massil.* p. 32; *Bl.* taf. 181; *Bl. Schn.* p. 192; *Lacép.* iii. pp. 259, 275; *Risso, Ichthyol. Nice,* p. 187; *De la Roche, Ann. Mus.* xiii.

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[*] 1. Scorpæna asperella, *Benn. Zool. Journ.* iv. 1829, p. 40.—Sandwich Islands.
2. —— scrofina, *Cuv. & Val.* ix. p. 465.—Brazil.
3. —— inermis, *Cuv. & Val.* iv. p. 311.—Martinique.
4. —— novæ guineæ, *Cuv. & Val.* iv. p. 320.—S. papuensis, *Cuv. & Val.* iv. p. 321.—New Guinea.
5. —— mauritiana, *Cuv. & Val.* iv. p. 322.—Ile de France.
6. —— mossambica, *Peters, in Wiegm. Arch.* 1855, p. 241.—Mozambique.
7. Scorpænopsis neglecta, *Heck. Ann. Wien. Mus.* ii. 1840, p. 159.—East Indies.
8. Scorpæna burra, *Richards. l. c.* p. 215.—Depuch Island.
9. *Russell,* i. pl. 56.—Scorpæna venosa, *Cuv. & Val.* iv. p. 317.—Pondicherry.
10. Scorpæna neglecta, *Temm. & Schleg. Faun. Japon. Poiss.* p. 43. pl. 17. f. 4; *Richards. Ichth. Chin.* p. 216.—Japanese Sea.
11. —— fucata, *Valenc. Voy. Vénus,* v. *Zool.* p. 313. pl. 3. f. 2.—Galapagos Archipelago.
12. —— rawakensis, *Quoy & Gaim. Voy. Freyc. Zool.* p. 325.—Polynesia.
13. —— guamensis, *Quoy & Gaim. l. c.* p. 326.—Guam.
14. —— guttata, *Gir. Proc. Ac. Nat. Sc. Philad.* 1854, p. 145, and *U. S. Pacif. R. R. Exped. Fishes,* p. 77. pl. 17. f. 1–4.—Coast of California.

p. 316; *Martens, Reise nach Venedig.* ii. p. 426; *Cuv. & Val.* iv. p. 300; *Gronov. Syst. ed. Gray,* p. 117; *Dekay, New York Faun. Fishes,* p. 38; *Guichen. Explor. Algér. Poiss.* p. 41; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 378; *Agass. Poiss. Foss.* iv. p. 199. pl. L. f. 2.
Perca, *Gronov. Zoophyl.* no. 291.
Corystion, *Klein, Miss.* iv. p. 47. no. 13.
Cottus massiliensis, *Forsk.* p. 24.
Scorpæna massiliensis, *Lacép.* iii. p. 269.
Duhamel, Pêches, ii. sect. 5. pl. 3. f. 2.

D. $11 \left| \frac{1}{9} \right.$. A. $\frac{3}{5}$. L. lat. 65. Cæc. pylor. 8. Vert. 24 (? 23 *Agass.*).

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{5}$. The head is scaleless. The length of the snout is one-fourth, the width of the space between the orbits one-seventh of the length of the head; the space between the orbits is deeply concave, with two ridges, not terminating in spines posteriorly; vertex with a subquadrangular groove, broader than long. Orbital tentacles well developed. The third, fourth and fifth dorsal spines are the longest; their length is less than one-half that of the head. The third anal spine as long as, or longer than, the second, nearly one-third the length of the head[*]. Brownish-red, marbled with darker, and dotted with deep black, the dots sometimes forming edges around the darker clouds; sometimes, in half-grown individuals, a black blotch on the posterior half of the spinous dorsal, and the black dots on the caudal fin arranged in cross-bands.

Mediterranean; crosses the Atlantic, and found at New York.

a, b. Adult: stuffed. Mediterranean.
c. Adult: skin. Mediterranean. From the Collection of the Zoological Society.
d. Adult. Dalmatia.
e, f. Half-grown: not good state. Adriatic. Purchased of Mr. Frank.
g. Adult. Bay of Naples. Presented by S. P. Pratt, Esq.
h. Half-grown. Bay of Naples. Presented by S. P. Pratt, Esq.
i. Adult. Lisbon.
k. Adult: stuffed. Lisbon. Presented by G. Hough, Esq.
l. Adult: stuffed. Lisbon.
m. Fine specimen. Lanzarote. Presented by the Rev. R. T. Lowe.
n. Adult: not good state.
o. Adult. From the Haslar Collection.
p. Half-grown. From the Haslar Collection.
q–t. Young and half-grown. From the Haslar Collection.
u–w. Adult: stuffed. From the Collection of the Zoological Society.
x–z. Half-grown: skin. From Mr. Yarrell's Collection.

2. Scorpæna scrofa.

Σκορπιος, *Arist.* ii. c. 17, v. c. 9. 10, viii. c. 13; *Athen.* vii. p. 320.
Scorpæna, *Plin.* xxxii. c. 11; *Salv.* f. 202; *Rondel.* vi. c. 19. p. 201; *Gesner,* f. 45; *Bellon. Aquat.* p. 248.

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[*] In immature specimens the second anal spine is the longest.

Scorpius, *Willughby*, p. 331; *Ray*, p. 142.

Scorpæna, *Gronov. Mus. Ichth.* i. p. 46. no. 103.

Scorpæna scrofa, *L. Syst.* i. p. 453; *Gronov. Zoophyl.* i. p. 87. no. 290; *L. Gm.* i. p. 1215; *Brünnich, Ichth. Mass.* p. 32; *Bl.* taf. 182; *Bl. Schn.* p. 192; *Lacép.* iii. pp. 259, 280; *Risso, Ichth. Nice*, p. 188; *Martens, Reise nach Venedig*, ii. p. 426; *De la Roche, Ann. Mus.* xiii. p. 316; *Rosenth. Ichthyot. Taf.* t. 17. f. 2; *Cuv. & Val.* iv. p. 288; *Guichen. Explor. Algér. Poiss.* p. 41; *Lowe, Fishes of Mad.* p. 105. pl. 16.

Duhamel, Pêches, ii. sect. 5. p. 94. pl. 4.

Scorpæna barbata, *Lacép.* iii. p. 274.

—— lutea, *Risso, Ichth. Nice*, p. 190, and *Eur. Mérid.* iii. p. 371.

D. $11 \mid \frac{1}{10}$. A. $\frac{3}{5}$. L. lat. 40–46. Cæc. pylor. 8. Vert. 24.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head three times. The head is entirely scaleless and smooth; the length of the snout is $3\frac{1}{3}$ in that of the head, the width of the space between the orbits $7\frac{1}{2}$. Space between the orbits deeply concave; vertex with a quadrangular groove, which is rather broader than long; orbital tentacles moderate. The third dorsal spine is the longest, nearly one-half the length of the head; the length of the second anal spine is $2\frac{2}{3}$ in that of the head. Red: body and fins marbled with brown; a black blotch between the sixth and ninth dorsal spines.

Mediterranean and the parts of the Atlantic nearest to it.

a. Large specimen: stuffed. Mediterranean.

b. Adult. Mediterranean. From the Haslar Collection.

c. Adult: skeleton. Mediterranean.

d. Half-grown: skin. Mediterranean. From the Collection of the Zoological Society.

e–h. Half-grown: bad state. Malta. From the Haslar Collection.

i. Half-grown. Dalmatia. Purchased of Dr. Heckel.

k. Young. North Africa. Presented by J. Burton, Esq.

l. Large specimen: stuffed. Lisbon. Presented by G. Hough, Esq.

m. Half-grown: stuffed. Lisbon.

n. Half-grown. River Niger. From Mr. Fraser's Collection.

o. Half-grown. Azores. From Ida Pfeiffer's Collection.

p. Adult. Madeira. From the Haslar Collection.

q. Half-grown. Madeira. From the Haslar Collection.

r. Young. Madeira. Purchased of Mr. Stevens.

s. Adult. Presented by the Zoological Society.

t. Adult: stuffed.

u, v. Half-grown: stuffed: not good state.

w, x. Young: bad state.

y. Half-grown: skin. From Mr. Yarrell's Collection.

z, α. Adult: stuffed: bad state. From the Collection of the Zoological Society.

β. Stomach and pyloric cæca of specimen *c*.

Skeleton.—The structure of the skeleton is so very much like that of *Sebastes*, that a separation into two genera appears to be admissible for convenience sake only. The quadrangular groove on the occiput is formed by four ridges. The infraorbital plate, articulating with the præoperculum, is rather broad; there is another plate between it and the præorbital; the interoperculum is small, with a rudimentary muciferous channel. There are twenty-four vertebræ; but the hæmapophysis of each of the last four abdominal vertebræ is not separated from its fellow. The first interhæmal is suspended on the tenth and eleventh vertebræ.

3. **Scorpæna ustulata.**

Lowe, Proc. Zool. Soc. 1840, p. 36

D. $\frac{12}{9}$. A. $\frac{3}{5}$. (L. lat. 24.) Vert. 10/14.

The height of the body is $3\frac{2}{5}$ in the total length, the length of the head nearly three times. The head is scaleless, but *the cheeks and opercles are pustulate or granulated.* The length of the snout is one-fourth of that of the head, the width of the space between the orbits one-seventh or one-eighth. Space between the orbits deeply concave; (groove on the crown of the head as in *Sc. scrofa*;) orbital tentacles none, or small. The fourth dorsal spine is the longest; the anal spines as in *Sc. scrofa* (the second the longest). A black blotch between the sixth and ninth dorsal spines; an irregular chestnut-brown and blackish mark behind the eye, extending principally over the opercle.

Sea of Madeira.

The characters of the above diagnosis have been drawn from MS. notes, kindly communicated to me by the discoverer of the species. The species appears to be of rare occurrence; and to enable other observers to point out its constant characters, I think it useful to give here some further details of the three specimens examined by Mr. Lowe, and to publish part of his notes as they were written on the spot.

"First specimen, Nov. 23, 1839.

"Second specimen, Dec. 24, 1839. This fish is intermediate between *Sc. scrofa* and *Sebastes maderensis.* The back is high and gibbous at the nape. The eyes are prominent and raised above the profile, as much as in *Sc. scrofa,* with the space between them very deep, channelled, and equalling in width the semidiameter of the eye. The orbits are toothed, and in all respects as in *Sc. scrofa.* The muzzle is very short, broad and obtuse, extending only once the diameter of the eye before it (as in *Seb. maderensis*). The jaws are equal in length, and the tubercle beneath the tip of the lower is inconspicuous. The hump before the nostrils is very distinct and high.

"The general disposition of the spines of the bones of the head is most like in *Sc. scrofa.* The præorbital has two or three strong spines in the middle, the uppermost being longest; its lower angle also is produced downwards into a prominent broad point; the point of its upper edge is concealed behind the lower point of the nasal; these two points are the ends of two diverging ribs, between which is the pair of spines above mentioned. The infraorbital ridge is toothed precisely in the same way as in *Sc. scrofa*; there is, however, only a single very strong, hooked prickle, halfway between the eye and the lower suprascapulary spine, and none immediately behind the eye on the posterior frontal. The lower of the two suprascapulary spines is much the strongest. The scapulary is inconspicuous, being very closely adpressed. The hinder of the posterior pair on the nape, and the two opercular spines are very strong and prominent. The two upper præopercular spines slender, but strong and produced; the three lower ones strong and broad, but short. The humeral forms a single strong, flattened, adpressed point above the axil.

"The pectoral fins are enormously large and wide, with the ten inferior rays simple. The ventrals large, and as long as the pectorals, rounded at the tips; the last ray is webbed halfway up to the body. Dorsal just as in *Seb. maderensis*, viz. with the fourth ray [spine] a little longer than the third, the second one-third longer than the first, the third one-third longer than the second. The last soft ray is webbed to the back nearly all its length. The last ray of the anal free, or webbed only quite in the axil of the base. Caudal simple and fan-shaped rather than truncate.

"No tentacles, except a small one at the back of the anterior nostril. The roughness of the cheeks and opercles is formed by numerous distinct warts or hard fleshy granules, without trace of scales. The scales on the body are large, and in other respects as in *Sc. scrofa*, but evidently ciliated, and offering considerable resistance to the finger when drawn from the tail forwards; they end abruptly at the base of the caudal, as in *Sc. scrofa*. The lateral line is as usual (*e. g.* as in *Sebastes maderensis*), consisting of twenty-four scales*, each marked with a little tooth or point projecting beyond its hinder edge.

"Colour without bands, mottled vermilion or coral-red and paler: spotted irregularly, chiefly above the lateral line, on the opercles and the muzzle with black specks; rosy about the lower part of the head, the pectorals, gills, throat, breast and ventrals; fins mottled red and yellowish, with similar round spots, the ventrals and anal being, however, nearly immaculate. But the great peculiarity of the species is an irregular chestnut-brown and blackish mark behind the eye, extending principally over the opercle. In this specimen it even tinges the hind part of the eye. The black spot on the dorsal fin is only faint between the eighth and ninth spines.

"The third specimen, April 22, 1841, forms a variety. It differs in the colour being black and mottled above, the throat and belly only rosy. Pretty copious, but small and simple laciniæ on the body. It answers perfectly to the foregoing description, with the following exceptions:—

"1. Between the eye and the lower suprascapulary spine there is a pair of prickles (one behind the other), or a single one (on the right side).

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* Mr. Lowe has evidently counted the small scales only by which the lateral line itself is constituted, whilst I count the transverse series of scales in all cases where the scales of the lateral line are not fully developed. It is to be presumed that the number of the scales will be nearly the same as in *Sc. scrofa*.

"2. The second supraorbitary spine is sufficiently distinct.

"3. The ventrals are shorter than the pectorals, yet reach as far backwards, viz. to the origin of the anal.

"4. The whole upper part of the fish is dark blackish; body (sides) mottled with suffused black spots on a brown ground, freckled with bright green specks about the nape and the shoulders; dorsal spotted with black; anterior portion of the soft dorsal and the lower of the caudal rosy; a large suffused black patch from the seventh to the tenth ray [spine ?]."

	Spec. II. inches.	Spec. III. inches.
Total length	$8\frac{1}{2}$	$7\frac{1}{8}$
Height of the body	$2\frac{1}{2}$	$2\frac{1}{8}$
Length of the head	3	$2\frac{1}{2}$
Diameter of the eye	$0\frac{3}{4}$	$0\frac{7}{8}$
Distance between the eyes	—	$0\frac{3}{8}$
Length of the pectoral	2	$1\frac{3}{4}$–2
——— of the ventral	$1\frac{7}{8}$	$1\frac{1}{2}$

4. Scorpæna brasiliensis.

Cuv. & Val. iv. p. 305; *Casteln. Anim. nouv. ou rares Amér. Sud, Poiss.* p. 7.

D. 11 | $\frac{1}{9}$. A. $\frac{3}{5}$. L. lat. 50.

The height of the body is $3\frac{2}{3}$ in the total length, the length of the head $3\frac{1}{2}$. The base of the operculum is scaly, the remainder of the head scaleless. The length of the snout is nearly one-fifth of that of the head, the width of the space between the orbits one-sixth. The space between the orbits is deeply concave, and is provided with two low ridges; vertex with a deep quadrangular cavity, broader than long, surrounded by strong spines. Orbital tentacles moderate. The fourth dorsal spine is the longest, one-half the length of the head; the third anal spine is rather longer than the second, and $2\frac{1}{2}$ in the length of the head; pectoral fin elongate, extending to the vertical from the first soft anal ray. Nearly uniform blackish (in spirits), with some obscure black clouds and dots.

Coast of Brazil.

a. Adult. South America. Purchased of Mr. Brandt.
b. Adult. Bahia. Purchased of M. Parzudaki.
c. Half-grown. Rio Janeiro. Presented by A. Fry, Esq.

5. Scorpæna cruenta.

Scorpæna cruenta, *Solander (Richards.) Ann. & Mag. Nat. Hist.* ix. 1842, p. 217.
—— ergastulorum, *Richards. ibid.*
—— militaris, *Richards. Voy. Ereb. & Terr. Fishes*, p. 22. pl. 14. f. 1, 2.

D. 11 | $\frac{1}{10}$. A. $\frac{3}{5}$. L. lat. 45.

The height of the body is nearly equal to the length of the head,

and $3\frac{1}{2}$ in the total. The head has scarcely any scales, the scales on the opercles being very rudimentary. The length of the snout is one-fourth of that of the head, and the width of the space between the orbits is contained $6\frac{1}{2}$ times in it. The space between the orbits is concave, with two ridges, each of which terminates posteriorly in a spine; vertex with a shallow quadrangular groove, which is surrounded by very prominent spines; orbital tentacles moderate. The third dorsal spine equals the second of the anal fin, and is more than one-half the length of the head. Reddish, marbled with lighter and darker; fins spotted with blackish; a black blotch on the posterior half of the spinous dorsal fin.

Coast of Van Diemen's Land and New Zealand.

a. Type of the species: bad state: has been in chloride of zinc. Port Arthur. From the Haslar Collection.

6. Scorpæna bynoensis.

Richards. Voy. Ereb. & Terr. Fishes, p. 22. pl. 14. f. 3, 4.

D. $11 \left| \frac{1}{8\text{–}11}\right.$. A. $\frac{3}{5}$. L. lat. 45.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{4}$. The head is scaleless, except on the upper parts of the cheek and of the operculum. The length of the snout is one-fourth, the width of the space between the orbits one-sixth of the length of the head. The space between the orbits is deeply concave, without or with very inconspicuous ridges, not terminating in a spine posteriorly; vertex with a shallow quadrangular groove, rather broader than long, and surrounded by very prominent spines; orbital tentacles moderate. The fourth and fifth dorsal spines are the longest, half the length of the head, and shorter than the strong second spine of the anal. Body and fins variegated with brownish and whitish.

N.W. coast of Australia.

a, b. Adult. N.W. coast of Australia. From the Haslar Collection.
c, d. Young. Presented by J. B. Jukes, Esq.

7. Scorpæna plumieri.

Parra, p. 34. pl. 18. f. 1.
Scorpæna plumieri, *Bl. Schn.* p. 194, and *Nya Handl.* 1789, x. p. 234. pl. 7. fig. 1 (bad).
—— bufo, *Cuv. & Val.* iv. p. 306; *Richards. Faun. Bor. Amer. Fishes*, p. 300; *Dekay, New York Fauna, Fishes*, p. 59. pl. 70. f. 227.
Scorpæna rascasio, *Casteln. Anim. nouv. ou rares Amér. Sud, Poiss.* p. 7.
Apistes exul (!), *Gosse, Natur. Soj. Jamaica*, p. 207.

D. $11 \left| \frac{1}{10}\right.$. A. $\frac{3}{5}$. L. lat. 45. Cæc. pylor. 8.

The height of the body is nearly one-fourth of the total length, the length of the head not quite one-third. Operculum, temple and cheek scaly. The length of the snout is four times in that of the head, the width of the space between the eyes $5\frac{2}{3}$. The space between the eyes is deeply concave, with two very low ridges; the vertex with a shallow quadrangular groove, as long as broad, and surrounded by spines; spines of the head very strong; a triangular groove below the anterior angle of the orbit. Dorsal spines strong; the third to the sixth are the longest. Marbled with brown, greyish, rose-coloured and violet; the spinous dorsal with a black blotch; the caudal with well-marked broad brown bands; axil black, with large white spots.

Atlantic shores of Tropical America and of the United States.

a. Adult. West Indies. Purchased of Mr. Scrivener.
b. Adult. West Indies. Purchased of Mr. Scrivener.
c. Large specimen: stuffed. West Indies. Purchased of Mr. Scrivener.
d–g. Skins. Jamaica. From Dr. Parnell's Collection.
h. Adult: stuffed. South America.
i. Adult. Presented by General Hardwicke.
k. Adult. From the Collection of the Zoological Society.
l–n. Adult and half-grown. From the Haslar Collection.
o. Adult. From the Haslar Collection.
p. Half-grown: bleached.
q. Young.
r–t. Adult: stuffed.
u. Adult: stuffed. From the Collection of the Zoological Society.

8. Scorpæna grandicornis.

Scorpæna plumieri, *Lacép.* ii. pl. 19. f. 3, iii. p. 282 (not *Bl. Schn.*).
—— grandicornis, *Cuv. & Val.* iv. p. 309.

D. $11 \mid \frac{1}{10}$. A. $\frac{3}{5}$. L. lat. 40.

The height of the body is about equal to the length of the head, and $3\frac{1}{3}$ in the total. Scales on the base of the operculum and on the cheek. The space between the eyes is very concave, without prominent ridges, and its width is about $6\frac{1}{3}$ in the length of the head. Vertex with a deep square groove; orbital tentacles elongate, broad and fringed. The third dorsal spine is about equal to the second of the anal fin, and $2\frac{1}{3}$ in the length of the head. Reddish, marbled with brown; head and body minutely dotted with white; caudal and anal fins with broad brown bands.

Caribbean Sea.

a–d. Half-grown: skins. Jamaica. From Dr. Parnell's Collection.
e. Half-grown: stuffed: not good state.

9. Scorpæna picta.

Scorpæna picta, (*Kuhl & van Hass.*) *Cuv. & Val.* iv. p. 321; *Cantor, Catal.* p. 40.

D. $11 \mid \frac{1}{10}$. A. $\frac{3}{5}$. L. lat. 37.

The height of the body is three times in the total length, the length of the head $2\frac{2}{3}$. The head is nearly entirely scaleless. The length of the snout is $3\frac{1}{2}$, the width of the space between the eyes $7\frac{1}{2}$ in the length of the head. The space between the eyes is deeply concave, with two low ridges, which do not terminate in spines; vertex with a shallow groove, surrounded by strong spines; orbital tentacles none; the posterior spine of the præorbital bent forwards. The fourth and fifth dorsal spines are the longest, about one-third the length of the head, and shorter than the anal spines. Body and fins marbled with brown; axil brown, with reniform whitish spots.

East Indian Archipelago.

a. Adult. Purchased of Mr. Frank as *Sc. novæ-guineæ*.
b. Adult. Celebes.
c. Young. Purchased of Mr. Jamrach.

10. **Scorpæna polyprion.**

Bleeker, Sclerop. p. 21, and *Verhand. Batav. Genootsch.* xxii. *Bali*, p. 5, and *ibid. Sclerop.* p. 7.

D. $11 \left| \frac{1}{10} \right.$. A. $\frac{3}{5}$. L. lat. 47.

The height of the body is $3\frac{2}{3}$ in the total length, the length of the head three times. The head is scaleless, except on the temple and the basal part of the operculum. The length of the snout is nearly one-third, the width of the space between the orbits one-eighth of the length of the head. The space between the orbits is deeply concave, with low ridges, which do not terminate in spines; vertex with a shallow quadrangular groove, broader than long, and surrounded by very prominent spines; orbital tentacles none; præorbital with a skinny flap. The fourth dorsal spine is the longest, nearly one-third the length of the head, and much shorter than the second of the anal fin. Brown, marbled with darker; axil without or with very inconspicuous lighter spots.

East Indian Seas.

a. Half-grown. Amboyna. Purchased of Mr. Frank.
b. Young. Amboyna. Purchased of Mr. Frank.
c. Young. Borneo.
d. Half-grown. Ceylon. Presented by Captain Gascoigne.
e. Half-grown: bad state. From the Haslar Collection.

11. **Scorpæna histrio.**

Jenyns, Zool. Voy. Beagle, Fishes, p. 35. pl. 8.

D. $11 \left| \frac{1}{9} \right.$. A. $\frac{3}{5}$.

The height of the body is one-fourth of the total length, the length of the head rather less than one-third. Scales on the cheek, temple, and base of the operculum. The diameter of the eyes is $4\frac{1}{2}$ in the length of the head; the space between very concave, with two whitish lines in the central furrow, scarcely elevated into salient ridges. No groove below the eye; the lower jaw a little the longest. Vertex with a groove, surrounded by strong spines; orbital tentacles well developed. The third dorsal spine is the longest, and $2\frac{2}{3}$ in the length of the head, more slender than, but nearly as long as the second of the anal fin. Scarlet-red: fins rather paler, with small, irregularly shaped blackish spots. (*Jen.*)

Chatham Island (Galapagos Archipelago).

12. Scorpæna erythræa.

Scorpæna erythræa, *Cuv. & Val.* iv. p. 316.
—— aurita, *Rüppell, N. W. Fische*, p. 106. taf. 27. f. 2.

D. 11 $\big|\,\frac{1}{10}$. A. $\frac{3}{5}$. L. lat. 45. Cæc. pylor. 2.

The height of the body is three times in the total length, the length of the head $2\frac{3}{4}$. Head entirely scaleless; jaws equal in front; orbital tentacles moderate. The length of the snout is one-fourth, the width of the space between the orbits one-seventh of the length of the head. The space between the eyes is deeply concave, with two low ridges, which do not terminate in spines; vertex with a very shallow groove, surrounded by strong spines. The posterior spine of the præorbital bent forwards. The fourth and fifth dorsal spines are the longest, $2\frac{1}{2}$ in the length of the head, and much shorter than the second of the anal. Body and fins marbled with brown; axil with some brown spots.

Red Sea.

a. Half-grown. Red Sea.

13. Scorpæna cardinalis.

Scorpæna cardinalis, (*Solander*) *Richardson, Ann. & Mag. Nat. Hist.* 1842, ix. p. 212.

D. 11 $\big|\,\frac{1}{9}$. A. $\frac{3}{5}$. L. lat. 55.

The height of the body is $3\frac{2}{3}$ in the total length, the length of the head $3\frac{1}{5}$. Cheeks and the upper portion of the operculum with rudimentary scales. The space between the eyes is exceedingly deep, with one central and two lateral ridges; its width is half the diameter of the eye, which is one-fifth of the length of the head. A slight groove below the eye; crown of the head with very strong, compressed, trenchant spines, and with a groove, which is divided into a central and two lateral portions. Orbital tentacles (in some of the specimens) present. The spinous dorsal is as high as the soft; the third and fourth spines are the longest, $2\frac{1}{2}$ in the length of the head; the length of the eleventh spine is not half that of the twelfth. The second anal spine strong, with a longitudinal groove. Red, marbled and spotted with brown.

Australian Seas.

a–c. Adult: skins. Australia. Purchased of Mr. Warwick.
d–f. Half-grown: skins. Australia. Purchased of Mr. Warwick.
g. Half-grown: dried: not good state. From the Collection of the Zoological Society.

14. Scorpæna haplodactylus.

Scorpæna bandanensis, *Bleeker, Banda*, i. p. 237.
—— aplodactylus, *Bleeker, Ceram*. ii. p. 698.

D. $\frac{12}{9}$. A. $\frac{3}{5}$. L. lat. 25 (?).

The height of the body is $3\frac{2}{3}$ to $3\frac{1}{3}$ in the total length, the length of the head three times. The upper portion of the operculum scaly. The diameter of the eye is 3 to $3\frac{1}{2}$ in the length of the head; the distance between the eyes equals one-half or two-thirds of their diameter. No groove below the eye; jaws nearly equal in front. Vertex with prominent spines; orbital tentacles moderate. The spinous dorsal is scarcely lower than the soft, and half as high as the body. Brownish, marbled with darker: ventrals black, yellowish at the base and margin; anal yellowish, with a broad black longitudinal band; caudal with two brown cross-bands. (*Bl.*)

Seas of Banda and Ceram. (Feejee Islands?)

a–e. ? Young. Feejee Islands. Voyage of the 'Herald.'

15. Scorpæna panda.

Scorpæna panda, *Richards. Ann. & Mag. Nat. Hist.* 1842, ix. p. 216.
Sebastes pandus, *Richards. Voy. Ereb. & Terr. Fishes*, p. 70. pl. 41. f. 3, 4.

D. $12 \mid \frac{1}{8}$. A. $\frac{3}{5}$. L. lat. 67.

The anterior part of the spinous dorsal very high, and the spines nearly free, the length of the third spine being three-quarters of that of the head; the pectoral reaches to the middle of the anal fin; the interocular space very deep, the cavity on the crown a narrow transverse furrow. Maxillary scaly. Head and back dotted with black; caudal with two broad blackish cross-bands.

West coasts of Australia.

a. Adult: skin. King George's Sound.—Type of the species.

B. Species without palatine teeth.

16. Scorpæna diabolus.

Ikan Satan, *Renard*, ii. pl. 8. f. 35; *Valent.* iii. p. 399. f. 170; *Duhamel, Pêches*, ii. sect. 5. p. 92. pl. 3. f. 1.
Scorpæna diabolus, *Cuv. & Val.* iv. p. 312; *Richards. Ichth. Voy. Sulph.* p. 76. pl. 40; *Bleeker, Amboina & Ceram*, p. 266.

D. $11 \mid \frac{1}{10}$. A. $\frac{3}{5}$. L. lat. 44. Vert. 24.

The height of the body is $3\frac{2}{3}$ in the total length, the length of the head $2\frac{3}{4}$. The upper portion of the operculum scaly. The length of the snout is one-third of that of the head; the width of the interorbital space is much more than the diameter of the eye, and $4\frac{3}{4}$ in the length of the head; it is concave, without ridges; vertex with a quadrangular groove, either square or rather broader than long, and with spines on each corner; a deep groove below the anterior angle of the orbit. Dorsal spines strong; the third and fourth are the longest, $4\frac{1}{4}$ in the length of the head, and shorter than those of the anal fin. Red, marbled with brown and bluish-white: pectorals spotted or banded with black interiorly; caudal with brown cross-bands.

East Indian Ocean and Archipelago; Otaheiti.

a. Half-grown. Tahiti. Purchased of M. Parzudaki.
b. Adult. New Guinea. Presented by Captain Sir E. Belcher.
c. Half-grown. China. Presented by J. R. Reeves, Esq.
d. Half-grown. Amboyna. Purchased of Mr. Frank.
e. Half-grown. Amboyna. Purchased of Mr. Frank as *Scorpæna gibbosa*.
f. Adult: skeleton. From the Haslar Collection.
g. Adult. Voyage of the 'Herald.'
h. Half-grown. From the Collection of the Zoological Society.
i. Adult: stuffed.

Skeleton.—All the bones of the skull are very solid and strong. The upper maxillary is styliform in its anterior half, and very broad and spatuliform in its posterior; the intermaxillary is much shorter, and has a broad plate-like process at the descending branch; the posterior processes are rather short. There is a wide open notch between the dentary and articular bones of the mandibula, and the former has a longitudinal ridge at its outer side, with a shallow groove above; pores and a muciferous channel are scarcely visible. The palatine bones are smooth, flat, horizontally situated, slightly bent downwards posteriorly. The præoperculum is narrow, crescent-shaped, with a very rudimentary muciferous channel: it is armed with five spines, the lower of which are obtuse; the uppermost is the most pointed, and has an additional spine at its base. The operculum is small, with two curved ridges, each terminating in a bundle of small spines; the suboperculum is joined to the operculum by two processes, receiving between them the lower angle of the latter; the interoperculum is oblong.

The turbinal bones are armed with several spines, one of which is more prominent than the others: the præorbital is irregularly shaped; several ridges radiate from a centre, and some terminate in spines: the two other infraorbital bones, which form the bony bridge to the præoperculum, are rather broad, exhibiting at their surface clusters of small spines; the ascending branch of the infraorbital ring is narrow. The ethmoid is intercalated between the principal frontal bones, which diverge anteriorly; each is provided with an erect process for the turbinal bones. The anterior frontals form the anterior part of the orbit, terminate superiorly in a spine, and emit inferiorly a process, between which and the præorbital the groove is situated, which is externally visible. The space between the orbits, formed by the principal frontal bones, is rather broad and concave, posteriorly covered with many small spines irregularly disposed; two of these spines are situated at the anterior corners of the quadrangular groove on the crown of the head; the two posterior corners are formed by the paroccipitals, a portion of the bottom by the supraoccipital. There is a slight occipital crest behind the groove and below its level. The basal portion of the brain-capsule is broad and depressed; the basisphenoid has no crest or foramen.

The glossohyal bone is small, styliform; the urohyal rather feeble, with the posterior side emarginate. The suprascapula is denticulated; the scapula and the coracoid are armed with a spine. The radius is styliform; the free space formed by it and the coracoid is very narrow and elongate. Each pubic bone is composed of two lamellæ, the upper and inner ones only being developed; there is no free space between the inner one and its fellow.

There are nine abdominal and fifteen caudal *vertebræ*, the former portion of the vertebral column being considerably curved. The centra of the second, third and fourth vertebræ are much compressed in their longitudinal diameter, whilst their neural spines are the most developed of all. The hæmapophyses of the last three abdominal vertebræ and of the first caudal vertebra are exceedingly strong, and the ribs are attached to their inferior extremity; the hæmapophysis of the seventh vertebra has two pairs of ribs. The first interhæmal spine is very strong, and suspended on the ninth vertebra.

All the teeth are in villiform bands, those of the intermaxillary and of the mandibula reaching to the extremity of the bones. The vomerine band is narrow and rectangularly bent. The pharyngeal teeth form broad patches.

17. Scorpæna nesogallica.

Scorpæna nesogallica, *Cuv. & Val.* iv. p. 315; *Cuv. Règne Anim. Ill. Poiss.* pl. 23. f. 1 (not good); *Less. Voy. Coq. Zool. Poiss.* p. 213.
Scorpænopsis nesogallica, *Heckel, Ann. Wien. Mus.* ii. 1840, p. 159.

$$\mathrm{D.}\ 11\,\Big|\,\frac{1}{10}.\quad \mathrm{A.}\ \frac{3}{5}.$$

The width of the interocular space equals one-half the diameter of the eye. Crown with a deep quadrangular groove. A large black spot at the inner base of the pectoral fins.

Ile de France.

18. Scorpæna gibbosa.

Bl. Schn. p. 192. tab. 44; *Trosch. Arch. Naturgesch.* vi. Band 1. p. 274; *Bleek. Act. Soc. Nederl.* i. *Amboina*, p. 31.

$$\mathrm{D.}\ 11\,\Big|\,\frac{1}{9}.\quad \mathrm{A.}\ \frac{3}{5}.\quad \mathrm{L.\ lat.}\ 36.$$

The height of the body is 3 to $3\frac{1}{3}$ in the total length, the length of the head about three times. Temple and the upper portion of the operculum scaly. The space between the eyes is very concave, and its width is equal to, or rather more than their diameter, which is one-fourth or one-fifth of the length of the head. Superciliary ridge with several spines; a deep groove below the eye; orbital tentacles well developed. The height of the spinous dorsal is less than half the depth of the body. Rose-coloured, largely marbled with brown; the spinous dorsal generally with a black blotch between the sixth and seventh spines. Pectoral fins superiorly (exteriorly?) with a broad purplish cross-band at the base and the tip; axil with many black dots; caudal with two broad purplish cross-bands. (*Bl.*)

Seas of China and Amboyna.

19. Scorpæna cirrhosa.

Perca cirrhosa, *Thunb. Nya Handl. Stockh.* xiv. 1793, p. 199. pl. 7. f. 2.
Scorpæna cirrhosa, *Cuv. & Val.* iv. p. 318; *Faun. Japon. Poiss.* p. 42. pl. 17. f. 2, 3; *Bleeker, Verhand. Batav. Genootsch.* xxvi. p. 79.
—— barbata, *Rüpp. N. W. Fische*, p. 105. taf. 27. f. 1.
? Scorpæna leonina, *Richards. Ichth. Chin.* p. 216 (in *Reeves's* figure the orbital tentacles are well developed).
Scorpæna oxycephalus, *Bleek. Sclerop.* p. 20, & *Verh. Batav. Genootsch.* xxii. *Sclerop.* p. 7.

D. 11 | $\frac{1}{10}$. A. $\frac{3}{5}$. L. lat. 54–58. Vert. 8/16.

The height of the body is $3\frac{3}{4}$ in the total length, the length of the head $2\frac{3}{4}$. Temple, operculum and suboperculum scaly. The length of the snout is nearly one-third of that of the head, the width of the space between the orbits about one-eighth. The space between the orbits deeply concave, with two ridges, which do not terminate in spines; vertex with a very shallow groove, surrounded by strong spines; a deep groove below the anterior angle of the orbit. The third dorsal spine is the longest, one-third the length of the head, and more feeble and rather shorter than the second of the anal. Orbital tentacles none or small, those on the angle of the mouth well developed. Red, clouded with violet and sparingly dotted with black; the spinous dorsal sometimes with a black blotch.

East Indian, Chinese, and Japanese Seas.

a. Adult. China. Presented by J. R. Reeves, Esq.
b. Adult. China. Presented by J. R. Reeves, Esq.
c. Adult. China.
d. Half-grown. China.
e. Half-grown: stuffed. China. Presented by J. R. Reeves, Esq.
f. Young. China.
g. Adult: stuffed. Japan.
h. Adult. Amboyna. Purchased of Mr. Frank as *Sc. oxycephalus*.
i. Adult: skeleton. Purchased of Mr. Frank.
k. Fine specimen. Raoul Island. Voyage of the 'Herald.'

Skeleton.—It is very much like that of *Scorpæna diabolus*, but is distinguished from it by the structure of the principal frontal bones, which, in this species, are narrow between the orbits and deeply excavated. Each is provided with a narrow muciferous channel, situated laterally to the ethmoid bone, which extends rather far backwards between the frontal bones. Several bones of the skull of *Scorpæna diabolus* are armed with clusters of small spines, whilst those bones in the present species bear only a single stronger spine at the same place. The coracoid terminates in two spines superiorly, the spine of the scapulary bone being very indistinct. The pubic bones are distinctly formed by three lamellæ.

Only eight *vertebræ* can be considered as abdominal, the first interhæmal spine being suspended on the ninth and tenth. The centra of the second and third vertebræ are much compressed in their longitudinal diameter; the structure of the hæmapophyses is the same as in the other species.

(*Species the dentition of which is not known.*)

20. Scorpæna chiliioprista.

? Scorpæna rubro-punctata, *Cuv. & Val.* iv. p. 324.
Scorpæna chilioprista, *Rüpp. N. W. Fische*, p. 107. taf. 27. f. 3.

$$D.\ 12 \,\Big|\, \frac{1}{9}. \quad A.\ \frac{3}{5}.$$

Operculum and præoperculum scaly; orbital tentacles moderate. Reddish-brown, clouded with darker; a broad lighter ring round the tail. (*Rüpp.*)

Red Sea.

21. Scorpæna laniaria.

Cuv. & Val. iv. p. 324.

$$D.\ \frac{11}{9}. \quad A.\ \frac{3}{5}.$$

The third spine of the præorbital is directed outwards. No skinny flaps. Dorsal nearly even. Reddish, largely marbled with black and dotted with white. (*Cuv.*)

Sea of Guam.

7. GLYPTAUCHEN*.

Apistus, sp., *Richards. Proc. Zool. Soc.* 1850, p. 58.

Head and body compressed; crown of the head with a deep saddle-like impression. Scales very small. Præorbital, præoperculum and operculum armed. Dorsal fin continuous, the spinous portion much more developed than the soft, with seventeen spines; the anal with three. No pectoral appendage. Villiform teeth in the jaws, on the vomer and the palatine bones. Seven branchiostegals.

King George's Sound.

1. Glyptauchen panduratus.

Apistus panduratus, *Richards. l. c.* pl. 1. f. 3 & 4, and *Ann. & Mag. Nat. Hist.* 1851, vii. p. 274.

$$D.\ \frac{17}{7}. \quad A.\ \frac{3}{6}. \quad V.\ 1/5.$$

The cleft of the mouth reaches to the vertical from the anterior margin of the eye; the seventh dorsal spine is the tallest; the second of the anal as long as the third, but stouter; the pectoral is very large, and reaches nearly to the origin of the anal. (*Rich.*)

King George's Sound.

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* From γλύφω and αὐχήν.

8. PTEROIS*.

Pterois, *Cuv. Règne Anim.*; *Cuv. & Val.* iv. p. 351.

Head and body compressed, the former armed with spines on its upper surface and on the sides, and provided with skinny flaps; no groove on the occiput; body covered with scales of moderate or small size. One dorsal, deeply notched, with twelve or thirteen spines; anal short; the spines and rays of some of the fins very elongate and generally free, but branched; no pectoral appendages. Villiform teeth in the jaws and on the vomer; none on the palatine bones. Seven branchiostegals. Air-bladder large; pyloric appendages in small number.

Tropical seas from the eastern coasts of Africa to Polynesia.

1. Pterois volitans.

Seba, iii. 28. 1 (bad); *Renard, Poiss.* i. 6, 41, i. 43, 215, ii. 15, 72; *Valentyn, Ind.* iii. p. 413. f. 210, and p. 415. f. 213; *Lacép.* ii. t. 17. f. 3; *Russell,* pl. 133.
Amboynese visch, *Nieuh. Bras. Lant- en Zee-Reize,* p. 268.
Gasterosteus volitans, *L.* i. p. 491.
Perca, sp., *Gronov. Zoophyl.* no. 294.
Scorpæna volitans, *L. Gm.* i. p. 1217; *Bloch,* t. 184; *Bl. Schn.* p. 193; *Gronov. Syst. ed. Gray,* p. 119; *Bennett, Fishes of Ceylon,* pl. 1.
Scorpæna mahe, *Lacép.* iii. p. 278.
Pterois volitans, *Cuv. & Val.* iv. p. 352. pl. 88; *Bleeker, Verhand. Batav. Genootsch.* xxii. *Sclerop.* p. 8; *Rüpp. N. W. Fische,* p. 107.

D. $12 \left| \frac{1}{11} \right.$. A. $\frac{3-2}{6-7}$. L. lat. 90. Cæc. pyl. 3. Vert. 10/14.

Nape of the neck naked; the space between the eyes very concave, its width being equal to the diameter of the eye, which is $1\frac{3}{4}$ in the length of the snout. The pectoral fins reach to, or beyond, the caudal fin. Red: snout, head, and the whole body with a great many narrow blackish cross-streaks; all the rays of the vertical fins spotted; the spots on the pectoral and ventral fins larger and between the rays.

From the eastern coasts of Africa through all the Indian Seas to the coasts of Australia.

a. Adult: not good state. Egypt. Presented by J. Burton, Esq.
b. Half-grown. S. Africa.
c. Young. Cape of Good Hope. Presented by Sir A. Smith.
d. Half-grown: not good state. Madras. Presented by T. C. Jerdon, Esq.
e. Adult. China. Presented by General Hardwicke.
f. Half-grown: not good state. China. Presented by General Hardwicke.
g. Adult Amboyna. Purchased of Mr. Frank.
h. Half-grown. Amboyna. Purchased of Mr. Frank.
i. Adult: skeleton. Purchased of Mr. Frank.
k. Adult: bad state. Purchased of Mr. Frank.

* 1. Pterois radiata, (*Solander*) *Cuv. & Val.* iv. p. 369.—Otaheiti.

l, m. Half-grown. Purchased of Mr. Frank.
n, o. Half-grown: very bad state. Cape Upstart. Presented by J. B. Jukes, Esq.
p. Half-grown: very bad state. Sydney. From the Haslar Collection.
q. Adult: stuffed. Australia.
r, s. Adult and half-grown. Old Collection.
t. Adult.

Skeleton.—The structure of the skeleton does not differ in any essential point from that of *Scorpæna,* or, in fact, from that of the typical Percoid forms. The extraordinary development of the rays of the fins is not accompanied by a similar development of the bones to which they are attached, simply because these fins appear to have no peculiar function, as in flying fishes, or in fishes where the spines of the fins are effectual weapons; they are, in *Pterois,* merely ornamental.

The maxillary bone is styliform in its upper half, spatuliform in its lower; the intermaxillary has a very broad prominence on its descending branch, which is longer than the posterior process. There is a free cleft between the dentary and articular parts of the mandibula; its muciferous channel is rudimentary. The anterior margin of the head of the vomer is prominent, and armed with a band of villiform teeth. The palatine bones are rather broad, horizontally situated. The turbinal bone is thin, tubiform, armed posteriorly with a feeble spine. The præorbital and the infraorbitals are thin and rather broad; the former has a rough surface, produced by ridges and grooves radiating from a centre,—the latter have a feeble, toothed, longitudinal ridge. The præoperculum is a crescent-shaped bone, with a distinct muciferous channel; its margin is armed with four spines, of which two, opposite to the infraorbital, are the most prominent; the two others, one at the angle and one at the lower margin, are rather obtuse. The other opercular pieces are thin, flexible; the operculum has a feeble ridge on its inner surface. The anterior frontals are rather narrow, produced backwards, and terminate posteriorly in a very feeble spine. The principal frontals diverge anteriorly to receive the ethmoid; their orbital margin is provided posteriorly with a spine, and elevated, thus rendering the space between the orbits concave; there is, moreover, a longitudinal groove along the middle of the intraorbital space. The crown is rather narrow, oblong, flat, with a ridge on each side, which terminates posteriorly in a spine. The scapula is spiniferous, the coracoid not. The basal portion of the brain-capsule is neither compressed nor swollen; the basisphenoid without groove or ridge. The glossohyal small and styliform; the urohyal triangular, with the posterior side notched. Each pubic bone is formed by three lamellæ, the interior of which is the most developed and closely adherent to its fellow.

There are ten abdominal and fourteen caudal *vertebræ,* the length of the former portion of the vertebral column being to that of the latter as 1 : 1·7. The centre of the second vertebra only is slightly compressed in its longitudinal diameter. The neural, hæmal, interneural, and interhæmal spines are of moderate length and strength, the anterior interneurals being dilated, so that they touch one another.

2. Pterois lunulata.

Temm. & Schleg. Faun. Japon. Poiss. p. 45. pl. 19.

$$D.\ 12 \mid \tfrac{1}{11}.\quad A.\ \tfrac{3}{7}.$$

Scales small, nape of the neck scaly; the space between the eyes is very concave, and its width is less than the diameter of the eye, which is one-half the length of the snout. The pectoral fins reach nearly to the extremity of the caudal. Orbital tentacles very short. Red: darker on the first dorsal, pectoral, and ventral fins. Two black streaks across the occiput, one descending behind the eye, on to the cheek, the other to the operculum. Body with a great many black cross-bars. Fins spotted with black; caudal generally uniform red.

Sea of Japan.

a. Adult: very bad state. From the Haslar Collection.

3. Pterois kodipungi.

Bleek. Banka, p. 450.

$$D.\ 12 \mid \tfrac{1}{11}.\quad A.\ \tfrac{3}{7}.\quad L.\ lat.\ 70.$$

The space between the eyes equals in width their diameter, which is $3\frac{1}{2}$ to 4 in the length of the head. The pectoral fins reach to, or beyond, the caudal. Orbital tentacles moderate. Red, with a great many brownish cross-bands; the soft portions of the vertical fins immaculate.

East Indian Archipelago. Coast of Australia.

a. Adult: stuffed. Australia. Presented by the Zoological Society.
b, c. Half-grown: dried: bad state.

4. Pterois antennata.

Pseudopterus, sp., *Klein, Miss.* v. p. 76. no. 1. tab. 4. f. 6.
Scorpæna antennata, *Bl.* t. 185; *Bl. Schn.* p. 193.
Pterois antennata, *Cuv. & Val.* iv. p. 361; *Less. Voy. Coq. Zool. Poiss.* p. 212; *Bleek. Solor*, p. 72.
—— geniserra, *Cuv. & Val.* iv. p. 366; *Belanger, Voy. Ind. Orient.* p. 353. pl. 1. f. 2.
—— russellii, *Benn. Proc. Comm. Zool. Soc.* i. p. 128.

$$D.\ 11 \mid \tfrac{1}{11}.\quad A.\ \tfrac{3}{6}.\quad L.\ lat.\ 55.\quad Vert.\ 9/15.$$

Nape of the neck scaly; the space between the eyes is very concave, and its width much less than the diameter of the eye, which is $1\frac{1}{4}$ in the length of the snout. The pectoral fins reach to, or beyond, the caudal. Rose-coloured: body with about thirteen brown cross-streaks, alternating with narrower ones of a yellowish-brown colour;

snout without bands, sometimes spotted. All the rays of the vertical fins spotted with brown; pectoral fins with two brown cross-bands at the base.

Indian Ocean and Archipelago.

a. Half-grown. Cochinchina. Purchased of M. Parzudaki.
b. Half-grown: bleached. China. From the Haslar Collection.
c. Half-grown. Amboyna. Purchased of Mr. Frank.
d. Half-grown. Pearl Islands.
e. Adult.
f. Adult: skeleton. Purchased of Mr. Gerrard.

The *skeleton* is very much like that of *Pterois volitans*; but wherever there are single spines in that species, there are clusters of small spines in *Pt. antennata*; the infraorbital ridge also has two series of small denticulations. The orbital portions of the frontal bones are very elevated, touching each other at the base and rendering the space between them very concave. The lateral ridges of the crown converge anteriorly, and are strongly serrated. No spine is visible on the lower margin of the præoperculum. There are nine abdominal and fifteen caudal vertebræ, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·7.

5. Pterois cincta.

Rüppell, N. Wirbelth. Fische, p. 108. tab. 26. f. 3.

D. 11 $\big|\frac{1}{11}$. A. $\frac{3}{6}$. L. lat. 50.

Nape of the neck scaly; the space between the eyes is very concave, and its width much less than the diameter of the eye, which is $1\frac{1}{4}$ in the length of the snout. The pectoral reaches to the extremity of the caudal. Head and body with six or seven broad, brown, white-edged cross-bands, the anterior through the eye. Snout unicoloured.

Red Sea; Navigator and Pearl Islands.

a. Adult. Navigator Islands. Presented by the Rev. W. Stair.
b. Adult. Navigator Islands. Presented by the Rev. W. Stair.
c. Half-grown. Pearl Islands.

6. Pterois miles.

Scorpæna miles, *Bennett, Fishes of Ceylon,* pl. 9 (faulty).
Pterois muricata, *Cuv. & Val.* iv. p. 363; *Rüpp. N. W. Fische,* p. 107.
—— miles, *Cant. Catal.* p. 42.

D. 12 $\big|\frac{1}{11}$. A. $\frac{3}{7}$. Vert. 10/14.

The spines of the head are very well developed. The space between the eyes is moderately concave, and its width equals the diameter of the eye. The pectorals do not reach to the caudal, and the upper four rays only are slightly detached. Many bands across the cheek and body; pectoral blackish, with whitish spots on the rays, and the inner surface black, dotted all over with white. The rays of the vertical fins spotted with black.

Red Sea; Indian Ocean.

7. **Pterois zebra.**

Renard, i. pl. 6. f. 41.

Pterois zebra, *Cuv. & Val.* iv. p. 367; *Règne Anim. Ill. Poiss.* pl. 24. f. 1 (not good); *Bleek. Amb. & Cer.* p. 265; *Quoy & Gaim. Voy. Uran. Zool.* p. 329, and *Voy. Astrol. Poiss.* p. 692. pl. 11. f. 6.

D. $12 \mid \frac{1}{10}$. A. $\frac{3}{6}$. L. lat. 48–50. Cæc. pylor. 3. Vert. 10/14.

Nape of the neck scaly; the space between the eyes is very concave, and its width much less than the diameter of the eye, which is $1\frac{1}{4}$ in the length of the snout. The upper and middle rays of the pectoral not, or slightly, detached from one another, and the fin does not reach to the caudal. The upper margin of the orbit with spines on the anterior and posterior angles only. Red: body with about six brown cross-bands, another across the opercles; cheeks spotted with brown. All the rays of the vertical fins black-spotted; pectorals with semilunar blackish spots between the rays.

Indian Ocean and Archipelago.

a. Adult. Amboyna. Purchased of Mr. Frank.
b. Half-grown. Amboyna. Purchased of Mr. Frank.
c. Half-grown. Amboyna. Purchased of Mr. Frank.
d. Half-grown: skeleton. Amboyna. Purchased of Mr. Frank.
e. Young. Amboyna. Purchased of Mr. Frank.
f, g. Half-grown. China. Presented by Capt. Sir E. Belcher.
h. Adult. From the Haslar Collection.
i. Adult. Madagascar. Presented by Dr. J. E. Gray.
k. Young. Purchased of Mr. Jamrach.

The *skeleton* of this species is exceedingly similar to that of *Pt. antennata,* and there is no difference in the bones of the skull, except in the infraorbital ridge being armed with a single series of spines. There are ten abdominal and fourteen caudal vertebræ, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·4.

8. **Pterois brachyptera.**

? Scorpæna koenigii, *Bl. Nya Handl. Stockh.* x. 1789, p. 235. tab. 7. f. 2.

Pterois brachyptera, *Cuv. & Val.* iv. p. 368; *Bleek. Amb. & Cer.* p. 265.

D. $12 \mid \frac{1}{9}$. A. $\frac{3}{6}$. L. lat. 45.

Nape of the neck scaly; the space between the eyes is very concave, and its width much less than the diameter of the eye, which nearly equals the extent of the snout. The upper and middle rays of the pectoral not, or slightly, detached from one another, and the fin does not reach to the caudal. The entire upper margin of the orbit provided with small spines. Reddish: body with broad, brown, rather irregular bands; the spinous dorsal brown, margined with black; the rays of the other vertical fins black-spotted; pectorals with about six black cross-bands.

Seas of Ceram and Amboyna.

a–f. Half-grown. Amboyna. From Mr. Frank's Collection.

9. **Pterois heterura.**

Bleek. Act. Soc. Sc. Indo-Nederl. i. p. 33.

D. $12\,|\,\frac{1}{9}$. A. $\frac{2}{7}$. L. lat. 36.

Caudal emarginate, with the lobes produced and about $2\frac{2}{3}$ in the total length. The width of the interocular space is about one-half the diameter of the eye, which is one-third of the length of the head. The pectoral fins reach to the caudal. Rose-colonred: the head with five or six, and the body with as many brown cross-bands; fins spotted. (*Bl.*)

Sea of Amboyna.

9. PTEROIDICHTHYS.

Pteroidichthys, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Amboina*, p. 33.

Head and body compressed; the former with skinny appendages, but with spines on the operculum and præoperculum only. Scales of moderate size. One dorsal, deeply notched, with eleven spines; anal short; *the rays of all the fins simple*; no pectoral appendages. Villiform teeth in the jaws and on the vomer; none on the palatine bones. Seven branchiostegals.

East Indian Archipelago.

1. **Pteroidichthys amboinensis.**

Bleeker, l. c. p. 34.

D. $\frac{11}{11}$. A. $\frac{2}{7}$. L. lat. 40.

The pectoral fins reach to the middle of the anal. Rose-coloured.

Seas of Amboyna and North Celebes.

10. TÆNIANOTUS.

Tænianotus, (*Lacép.*) *Cuv. & Val.* iv. p. 371.

Head and body compressed and elevated; the former armed with spines on the upper surface and on the sides. Scales small. One elevated dorsal, not notched, and *contiguous with the caudal*; the spinous portion with twelve (eleven) spines; anal and pectorals moderately long; ventrals thoracic; no pectoral appendages. Teeth in the jaws; vomerine teeth; none on the palatine bones.

East Indian Archipelago.

1. Tænianotus triacanthus.

Lacép. iv. p. 306; *Cuv. & Val.* iv. p. 371. pl. 89; *Cuv. Règne Anim. Ill. Poiss.* pl. 23. f. 2; *Guérin, Iconogr. Poiss.* pl. 13. f. 3; *Bleek. Amboina,* vi. p. 411.

D. $\frac{12(11)}{12(11)}$. A. $\frac{3}{7}$.

The height of the body is $2\frac{2}{3}$ in the total length: the pectoral reaches slightly beyond the origin of the soft anal.

Sea of Amboyna.

11. CENTROPOGON[*]

Apistus, sp., *Cuv. & Val.*

Head and body compressed, with distinct scales. No groove on the occiput. Præorbital and præoperculum spiniferous. One contiguous dorsal, with fourteen or fifteen spines; the spinous portion without division. No pectoral appendages. Villiform teeth in the jaws, on the vomer and the palatine bones. No cleft behind the fourth gill.

Australian Seas; East Indian Archipelago.

1. Centropogon australis.

Cottus australis, *White, Voy. N. S. Wales,* p. 266.
Apistus australis, *Cuv. & Val.* iv. p. 398.

D. $\frac{15}{9}$. A. $\frac{3}{5}$.

Scales very small; the pectoral reaches to the origin of the anal. The third dorsal spine is the longest, $1\frac{1}{2}$ in the length of the head; the second anal spine longer than the third. The upper maxillary reaches to the vertical from the anterior margin of the eye. Brownish (in spirits), with five rather irregular dark cross-bands, the first from the origin of the dorsal, the fourth on the base of the caudal, and the fifth across the caudal.

Coasts of South-East Australia.

a. Adult. Port Jackson. From the Haslar Collection.
b. Adult. Sydney. Presented by Lieut. A. Smith.
c. Adult: bad state. From the Haslar Collection.

2. Centropogon robustus.

D. $\frac{15}{9}$. A. $\frac{3}{5}$. L. lat. 85.

Scales small. The pectoral does not reach to the vent; the fourth and fifth dorsal spines are the longest, their length being less than one-half that of the head; the second and third anal spines are equal. The upper maxillary reaches behind the vertical from the centre of the eye. Brownish (in a dried state), marbled and variegated with blackish.

Australian Seas.

a, *b*. Adult: stuffed.

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[*] From κέντρον, spine, and πώγων, beard.

1. Apistus hypselopterus, *Bleek. Banda,* i. p. 238.—Sea of Banda.

Description.—This species approaches in general habit the genera *Sebastes* and *Scorpæna,* from which it must be separated on account of the number of the dorsal spines,—a much more certain generic character than the presence or absence of a præorbital spine, which is found in fishes that cannot be separated from *Sebastes* (*S. nematophthalmus*). Having only dried specimens of the present species, I am unable to prove the absence of a cleft behind the fourth gill; but the similarity with *C. australis* in other characters renders it very probable.

The height of the body is 3⅓ in the total length, the length of the head four times. The head is slightly compressed, with the upper surface rather flat, its width between the orbits being one-sixth of its length. The eye is situated immediately below the upper outline of the head, but does not interfere with it; its diameter is 5½ in the length of the head, and shorter than the snout. The cleft of the mouth is wide, the upper maxillary reaching somewhat behind the vertical from the centre of the eye. Each turbinal and occipital bone terminates posteriorly in a small spine; three very small spines are visible on the superciliary margin: the præorbital is armed with two spines, the anterior of which is flat, triangular, and directed downwards; the posterior is elongate, thorn-like, shorter than the diameter of the eye, and directed obliquely backwards. The suborbital ridge is flat, without any prominence: the præopercular margin is rounded, and provided with five spines, two of which are situated where the suborbital ridge joins the præoperculum; the uppermost is the strongest. The operculum terminates in two prominent spines; the coracoid spine is hidden beneath the skin. All the head appears to be scaleless, and there are no skinny appendages perceptible.

The *dorsal* fin commences at a distance from the occiput which equals the length of the first spine. All the spines are of moderate length: the second is about twice the length of the first and two-thirds of the third; the fourth and fifth are the longest, their length being less than one-half that of the head; the following decrease very slightly in length, the fourteenth and fifteenth being nearly equal to each other and to the second. The soft portion is rather more elevated than the spinous, but very much shorter, the length of its base being 3⅔ in that of the spinous. The four posterior rays rapidly decrease in length, and the last (split to its base) is fixed to the back of the tail by a membrane. The *caudal* fin is scaleless, with the posterior margin slightly rounded; its length is 5⅓ in the total. The *anal* commences opposite the soft dorsal, with three rather strong spines; it is higher than the dorsal. The rays of the *pectoral* are branched—the upper ones the longest, the lower ones the shortest; the fin reaches to the vertical from the ninth dorsal spine. The *ventrals* are inserted immediately behind the pectoral, and fixed to the belly by a membrane for one-half of their length; they reach as far backwards as the pectorals, and their spine is strong.

The jaw-bones, the vomer, and the palatine bones are armed with bands of villiform *teeth*; the vomerine band is crescent-shaped. The *scales* are small and finely ciliated.

The fish is now brownish, marbled and variegated all over with darker. There is a large dark-brown blotch between the fifth and eighth dorsal spines.

	inches.	lines.
Total length	12	0
Height of the body	3	7
Length of the head	3	2
Width between the orbits	0	6½
Diameter of the eye	0	7
Length of the first dorsal spine	0	6½
——— of the fourth dorsal spine	1	6
——— of the fifteenth dorsal spine	0	11½
——— of the third dorsal ray	1	7
——— of the caudal	2	3
——— of the third anal spine	1	3
——— of the first anal ray	1	10

3. Centropogon fuscovirens.

? Apistus fuscovirens, *Quoy & Gaim. Voy. Astrol. Poiss.* p. 695. pl. 11. f. 5; *Cuv. & Val.* iv. p. 409.

Apistus fuscovirens, *Bleeker, Amboina & Ceram,* p. 269.

B. 7. D. $\frac{14}{7}$. A. $\frac{3}{4}$.

Scales small. The cleft of the mouth is very slightly oblique; the jaws are nearly equal in front; the maxillary bone reaches to below the anterior half of the orbit. The dorsal begins above the eye; the second and third spines are the longest; the ventral fins reach to the anal; the third anal spine longer than the preceding ones. Brownish, spotted with darker; a large black blotch between the fifth and ninth dorsal spines. (*Bl.*)

Seas of Amboyna and Ceram.

4. Centropogon leucoprosopon.

Apistus leucoprosopos, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Amb.* p. 35.

B. 6. D. $\frac{14}{8}$. A. $\frac{3}{5}$.

Scales very small. The second dorsal spine is the longest; the third of the anal fin longer than the preceding ones. The upper maxillary reaches to below the anterior half of the orbit. Brownish-yellow, dotted with darker; snout, forehead and anterior part of the eye white; cheeks variegated with whitish; caudal with a broad reddish-yellow cross-bar. Palatine teeth. (*Bl.*)

Sea of Amboyna.

12. APISTUS*.

Apistus, sp., *Cuv. & Val.* iv. p. 391.

Polemius, *Kaup in Wiegm. Archiv Naturg.* 1858, p. 333.

Head and body compressed, covered with ctenoid scales of rather small size. Several bones of the head, and especially the præorbital, armed. One dorsal with fifteen spines, the anal with three; one pectoral filament; pectoral elongate (organ for flying). Villiform teeth in the jaws, on the vomer and the palatine bones. Air-bladder present. A cleft behind the fourth gill.

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* 1. Scorpæna carinata, *Bl. Schn.* p. 193.—Apistus carinatus, *Cuv. & Val.* iv. p. 395.—Tranquebar.

Red Sea; East Indian Seas.

It will be necessary to divide the genus *Apistus*, as given by Cuvier; and I propose the following arrangement:—

A. With a cleft behind the fourth gill.
  I. With a pectoral appendage.
    a. Body scaly: APISTUS.
    b. Body naked: MINOUS.
  II. Without a pectoral appendage: PENTAROGE.

B. Without a cleft behind the fourth gill.
  I. With distinct scales: CENTROPOGON.
  II. With rudimentary or without scales.
    a. The spinous dorsal fin with a shorter anterior division: PROSOPODASYS.
    b. The spinous dorsal fin contiguous, without any division: TETRAROGE.

1. Apistus alatus.

Russell, ii. p. 45. pl. 160. B.
Apistus alatus, *Cuv. & Val.* iv. p. 392; *Bleek. Natuurk. Tydschr. Nederl. Indie*, 1851, p. 174; *Faun. Japon. Poiss.* p. 49.
Polemius alatus, *Kaup in Wiegm. Archiv*, 1858, p. 333.

$$D. \frac{15}{9}. \quad A. \frac{3}{7}.$$

Body scaly; one detached pectoral ray; pectoral elongate, reaching to the root of the caudal; dorsal fin contiguous, but with a notch between the spinous and soft portion. Nape of the neck whitish (in spirits); pectoral and anal blackish; the spinous dorsal with a large black blotch between the eighth and twelfth spines, the soft portion with three oblique blackish streaks.

East Indian Seas.

a, b. Adult. Madras. Presented by T. C. Jerdon, Esq.

2. Apistus israëlitarum.

Apistus israëlitarum, (*Ehrenbg.*) *Cuv. & Val.* iv. p. 396.

$$D. \frac{15}{7}. \quad A. \frac{3}{7}.$$

Body scaly; one detached pectoral ray; pectorals elongate. A black blotch between the tenth and eleventh dorsal spines; the soft dorsal and the anal without bands. (*Cuv.*)

Red Sea.

13. ENNEAPTERYGIUS.

Enneapterygius, *Rüppell, N. W. Fische*, p. 2.

Three separate dorsal fins, the first two spinous; ventrals jugular, with two rays; no pectoral filaments. Head naked; præoperculum and infraorbital joined together. Scales large, lateral line interrupted.

Red Sea.

1. Enneapterygius pusillus.

Rüppell, l. c. taf. 1. f. 2.

D. 3 | 11 | 8. A. 16. V. 2. P. 11. L. lat. 22.

Green: a brown, blue-edged band round the throat, from eye to eye; opercles minutely dotted with brown and blue. (*Rüpp.*)

Massuah.

14. PENTAROGE*.

Apistus, sp., *Cuv. & Val.* iv. p. 416.

Head and body compressed, without any scales. Præorbital and præoperculum with strong spines. One dorsal with twelve or thirteen spines, anal with three; no pectoral appendages. Villiform teeth in the jaws, on the vomer and the palatine bones. Air-bladder small; pyloric appendages in moderate number. A cleft behind the fourth gill.

Australian Seas.

1. Pentaroge marmorata.

Apistus marmoratus, *Cuv. & Val.* iv. p. 416; *Cuv. Règne Anim. Ill. Poiss.* pl. 24. f. 3.

B. 7. D. $\frac{12\,(13)}{19}$. A. $\frac{3}{6}$. Cæc. pylor. 6. Vert. 11/17.

The præorbital spine very long, dagger-shaped. Cleft of the mouth slightly oblique, with the upper maxillary reaching to the vertical from the centre of the eye. The dorsal begins on the neck. Dirty yellowish, largely marbled with brown.

Seas of Timor, Australia, and Van Diemen's Land.

a. Adult. Van Diemen's Land. From the Haslar Collection.
b. Adult. From the Haslar Collection.
c. Adult: stuffed. Australia. Purchased of Mr. Warwick.
d. Half-grown: not good state.

15. TETRAROGE†.

Apistus, sp., *Cuv. & Val.*

Head and body compressed, naked, or with minute rudimentary scales. Præorbital and præoperculum armed. One dorsal fin with twelve to seventeen spines; the spinous portion without any division; no pectoral appendages. Teeth in the jaws, on the vomer, and generally on the palatine bones. Air-bladder present; pyloric appendages in small number. No cleft behind the fourth gill.

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* From πέντε, and ῥωγή, a cleft. Five clefts between the gills; whilst other fishes, hitherto referred to *Apistus*, are provided with four only.

† Cfr. *Pentaroge*.

1. Apistus bougainvillii, *Cuv. & Val.* iv. p. 411.
2. —— belengerii, *Cuv. & Val.* p. 412; *Belenger, Voy. Ind. Orient.* p. 349.—Coast of Malabar.
3. —— amblycephaloides, *Bleeker, Sumatra*, ii. p. 8.—Sumatra.

Indian Ocean and Archipelago.

1. Tetraroge barbata.

Apistus barbatus, *Cuv. & Val.* iv. p. 413; *Bleeker, Act. Soc. Nederl.* i. *Amboina*, p. 36.

—— melas, *Bleeker, Natuurk. Tydschr. Nederl. Ind.* i. p. 26.

B. 7. D. $\frac{13}{8}$. A. $\frac{3}{5}$.

Two barbels near the symphysis of the lower jaw; the upper maxillary reaches to below the posterior half of the orbit. No scales. The spinous dorsal, without division, begins above the middle of the orbit; the third anal spine is the longest. Blackish or brownish, sometimes speckled with black; caudal variegated with brownish. Palatine teeth.

Molucca Sea.

2. Tetraroge amblycephalus.

Apistus amblycephalus, *Bleeker, Sclerop.* p. 27.

B. 7. D. $\frac{13}{8}$. A. $\frac{3}{5}$.

Barbels none. The cleft of the mouth is very slightly oblique; the jaws are equal in front. Scales minute, rudimentary. The spinous dorsal, without division, begins above the posterior margin of the eye. The ventrals do not reach to the anal. Greyish-brown, densely variegated with black. (*Bl.*)

Sea of Padang.

3. Tetraroge rubripinnis.

Apistus rubripinnis, *Temm. & Schleg. Faun. Jap. Poiss.* p. 49. pl. 22. f. 2.

D. $\frac{14}{7}$. A. $\frac{3}{4}$. V. 1/4.

Barbels none. Scales minute, rudimentary. The interocular space much narrower than the diameter of the eye. The spinous dorsal, without division, begins above the eye. Marbled with pale brown, reddish and bluish. The spinous dorsal with a black blotch between the sixth and ninth spines; all the other fins pale reddish, immaculate. (*Schleg.*)

Sea of Japan.

4. Tetraroge macracanthus.

Apistus macracanthus, *Bleeker, Amboina & Ceram*, p. 267.

B. 7. D. $\frac{15}{9}$. A. $\frac{3}{8}$.

Barbels none. Scales minute, rudimentary. The dorsal begins before the eye, is very high anteriorly, without any notch, and slightly contiguous with the caudal. Brown. Palatine teeth. (*Bl.*)

Sea of Wahai (North Ceram).

5. Tetraroge binotata.

Apistus binotatus, *Peters in Wiegm. Arch.* 1855, p. 241.

B. 7. D. $\frac{15}{9}$. A. $\frac{3}{6}$. V. 1/5.

Dorsal contiguous with the caudal; a reddish-white spot above the middle of the lateral line. (*Pet.*)

Coast of Mozambique.

6. Tetraroge longispinis.

Apistus longispinis, *Cuv. & Val.* iv. p. 408; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 694. pl. 11. f. 4.

Apistes multicolor, *Richards. Voy. Samar. Fishes,* p. 3. pl. 4. f. 3, 4.

B. 5. D. $\frac{14-15}{8-7}$. A. $\frac{3}{4}$.

Scales minute but conspicuous. The dorsal begins between the eyes, and is high anteriorly, without any notch, and not contiguous with the caudal; the pectoral and ventral fins reach to, or very nearly to the anal. Brownish, variegated with darker: fins dark brown, spotted with brown and striolated with whitish; a reddish-white spot above the middle of the lateral line; a black oblong blotch between the fifth and eighth dorsal spines.

East Indian Seas.

a. Adult. China. Presented by J. R. Reeves, Esq.
b. Half-grown. China. Presented by Sir J. Richardson.—Type of *Apistes multicolor.*
c. Half-grown. China. Presented by Captain Sir E. Belcher.
d. Half-grown. China. Presented by Captain Sir E. Belcher.
e. Half-grown. China. Presented by Captain Sir E. Belcher.
f. Half-grown. Borneo.
g, h. Adult. Amboyna. Purchased of Mr. Frank.
i. Adult. Bengal. Presented by General Hardwicke.
k, l. Adult: bad state. Ceylon. Presented by Captain Gascoigne.
m. Half-grown: bleached.

7. Tetraroge crista-galli.

Apistus tænianotus, *Richards. Voy. Samarang, Fishes,* p. 5. pl. 4. f. 1, 2 (not *Cuv. & Val.*).

B. 6. D. $\frac{17}{7}$. A. $\frac{3}{5}$.

Scales minute. The dorsal begins above the anterior margin of the eye, is very high anteriorly and nearly even behind, without notch, and slightly contiguous with the caudal. The pectoral and ventral fins reach nearly to the vent. Brown, with some scattered darker spots.

Philippine Islands.

a. Fine specimen. Philippines. From Mr. Cuming's Collection.

Description of the specimen.—This species is closely allied to *Tetraroge* *tænianotus*, with which it has been confounded by Sir J. Richardson, but may be readily distinguished from it by the shorter pectoral and ventral fins, and by the absence of a black blotch between the fifth and sixth dorsal spines.

The greatest depth of the body is above the root of the ventral fins, where it is contained $3\frac{5}{7}$ in the total length; the length of the head is one-fourth of the same. The upper profile of the snout descends in a nearly vertical line, the lower ascends in a very gentle curve, the cleft of the mouth being oblique; the latter is of moderate width, and the upper maxillary reaches somewhat beyond the vertical from the anterior margin of the eye. The præorbital spine is slightly curved, very acute, and of moderate length. The diameter of the eye is nearly equal to the length of the snout, and one-fourth of that of the head. The præopercular margin is armed with three or four teeth, the uppermost of which is the strongest; the others are obtuse. Operculum with two spines. The gill-membranes are slightly continuous under the throat, and not attached to the isthmus between.

The *dorsal* fin begins above the anterior margin of the eye, and is continued to the caudal, to which it is slightly attached by a short cutaneous fold. The first spine is about one-third the length of the second, which is the longest, and nearly as long as the head; the following four spines decrease in length, the eighth being not quite one-half the second; the last three spines are, again, a little longer. The membrane between the second, third and fourth spines is very wide, and is dilated into a superior convex flap. The soft portion of the dorsal has the upper margin rounded, and is rather lower than the second spine. The *caudal* is rounded, and composed of twelve rays; its length is $4\frac{1}{3}$ in the total. The *anal* begins vertically below the last dorsal spine, and is much lower than the opposite fin; it has three spines, the third of which is much longer than the second, and rather more than one-half the length of the head. The *pectoral* is rounded, composed of eleven branched rays, and reaches nearly to the vent. The *ventral* is inserted at some distance posteriorly to the pectoral, and does not reach to the vent; it has one spine and five rays, the interior of which is attached to the belly by a cutaneous fold for one-half of its length.

The *scales* are minute, rudimentary, concave.

The *teeth* are villiform, in the jaws, on the vomer, and in a small patch on the palatine bones.

The ground-colour is brown, with scattered irregular darker spots: the top of the membrane between the second and fourth dorsal spines is black; a lighter cross-streak before the first dorsal spine.

	inches.	lines.
Total length	4	4
Height of the body	1	2
Length of the head	1	1
Diameter of the eye	0	$3\frac{1}{3}$
Length of the second dorsal spine	0	11

	inches.	lines.
Length of the eighth dorsal spine	0	5
——— of the fourth dorsal ray	0	10
——— of the caudal	1	0
——— of the third anal spine	0	7
——— of the pectoral	1	1½
——— of the ventral	0	9½

8. Tetraroge tænianotus.

Tænianotus latovittatus, *Lacép.* iv. pl. 3. f. 2 (excl. descr.).
Apistus tænianotus, *Cuv. & Val.* iv. p. 404; [not *Richards. Voy. Samarang, Fishes,* pl. 4. f. 1, 2;] *Bleeker, Amboina,* ii. p. 557.

B. 5. D. $\frac{17}{8}$. A. $\frac{3}{5}$. Cæc. pylor. 4.

Scales minute, rudimentary. The dorsal begins between the eyes, is very high anteriorly and nearly even behind, without any notch, and slightly contiguous with the caudal; the pectoral and ventral fins reach beyond the vent. A brown spot between the fifth and sixth dorsal spines.

East Indian Seas.

a. Adult. Japan.
b. Young. Madras. Presented by T. C. Jerdon, Esq.

9. Tetraroge dermacanthus.

Apistus dermacanthus, *Bleeker, Amboina & Ceram,* p. 268.

B. 6. D. $\frac{12}{9}$. A. $\frac{3-2}{7-8}$. V. 1/3.

Skin studded with small prickles. The snout is longer than the eye, with the jaws nearly equal, and with the upper maxillary not reaching to the vertical from the orbit. Barbels none. The dorsal fin begins above the middle of the eye, and has no division; the two anterior spines are the longest; anal fin with small spines. Rose-coloured, punctulated with brown. Palatine teeth. (*Bl.*)

Sea of Wahai (North Ceram).

This species appears to approach *Agriopus.*

10. Tetraroge echinata.

Corythobatus echinatus, *Cant. Catal.* p. 45. pl. 13.
Cocotropus echinatus, *Kaup in Wiegm. Arch. Naturg.* 1858, p. 333

D. $\frac{13}{11}$. A. $\frac{2(-3?)}{8(-7?)}$.

Skin studded with small prickles. The snout is longer than the diameter of the eye; the lower jaw is slightly the longer; the upper maxillary reaches to the vertical from the anterior margin of the orbit. Barbels none. The dorsal fin begins between the anterior orbital margins, and has no division. The anterior spine is the longest; anal spines feeble. Umber, with light spots, edged with black. No palatine teeth. (*Cant.*)

Sea of Pinang.

16. AGRIOPUS*.

Agriopus, *Cuv. & Val.* iv. p. 380.
Cephalinus, *Gronov. Syst. ed. Gray*, p. 159.

Head and body compressed, the former without or with some small spines; præorbital spineless. Cleft of the mouth small; snout produced. Scales none. One dorsal, the spinous portion without division, beginning from the head, and with seventeen to twenty-one spines; anal short; no pectoral appendages. Villiform teeth in the jaws; generally none on the vomer. Five branchiostegals. Air-bladder present; no pyloric appendages.

Cape Seas; Coasts of Chile; South Australian Seas.

If Cuvier's observation, that the skeleton of *A. torvus* is composed of thirty-nine vertebræ, prove to be correct, this genus must be removed from the *Scorpænina*, and form probably a separate group.

1. Agriopus torvus.

Blennius torvus, *Gronov. Act. Basil.* vii. p. 47. tab. 3. f. 2.
Coryphæna torva, *Bl. Schn.* p. 298.
Agriopus torvus, *Cuv. & Val.* iv. p. 382.
Cephalinus glaber, *Gronov. Syst. ed. Gray*, p. 159.

D. $\frac{20}{14}$. A. $\frac{2}{6}$. Vert. 18/21 (*Cuv.*).

The height of the body is one-fourth of the total length. The third dorsal spine as long as the head; the length of the last is four or five times in that of the third. Skin smooth. Brown, sometimes marbled with blackish.

Cape Seas.

a. Adult: stuffed. Cape Seas.
b, c. Adult: stuffed.
d. 27 inches long: stuffed. Presented by Mrs. J. E. Gray.
e. 21 inches long: skin. From Gronov's Collection.

2. Agriopus leucopoecilus.

Richards. Ichth. Ereb. & Terr. p. 60. pl. 37. f. 4, 5.

D. $\frac{17}{13}$. A. 10.

The fourth and fifth dorsal spines are the longest, and shorter than the head. No spine before the orbit. Skin smooth. Largely marbled with black; some irregular whitish blotches along the lateral line.

South Australian Seas.

a. Adult: stuffed. Australian Seas. Presented by Capt. Stokes, R.N.
b. Adult: stuffed. King George's Sound. Presented by Sir John Richardson.

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* 1. Agriopus unicolor, *Burton, Proc. Zool. Soc.* iii. p. 116.—Cape Seas.

3. Agriopus peruvianus.

Agriopus peruvianus, *Cuv. & Val.* iv. p. 389; *Gay, Hist. Chil. Zool.* ii. p. 181, *Ictiol.* lam. 2 *bis,* f. 1; *Cuv. Règne Anim. Ill. Poiss.* pl. 25. f. 1.

$$D. \frac{17\text{–}18}{13\text{–}12}. \quad A. \frac{1}{8\text{–}9}.$$

The height of the body is $3\frac{1}{6}$ in the total length. The fourth, fifth and sixth dorsal spines are the longest, and shorter than the head. A small spine before each orbit. Skin smooth. Largely marbled with black.

Coast of Chile.

a. Adult. Chile. Presented by the Zoological Society.
b. Adult: bad state. South America. From Mr. Bridge's Collection.
c. Adult: dried. Chile. From Mr. Cuming's Collection.—(Cfr. *Zool. Beagle, Fishes,* p. 40, and *Proc. Zool. Soc.* ii. 1832, p. 5.)
d. Adult: stuffed. From the Collection of the Zoological Society.

4. Agriopus verrucosus.

Cuv. & Val. iv. p. 387. pl. 91.

$$D. \frac{20}{14}. \quad A. \frac{2}{6\text{–}7}.$$

Skin rasp-like; no spine before the eye. The third dorsal spine is as long as the head, and three times longer than the last spine. Yellowish-brown, marbled with darker; no black blotch on the dorsal fin.

Cape Seas.

a, b. Adult: stuffed. Cape of Good Hope. Presented by Sir A. Smith.
c–e. Half-grown: stuffed. Cape of Good Hope. Presented by Sir A. Smith.
f. Half-grown. From Mr. Frank's Collection.

5. Agriopus spinifer.

Agriopus spinifer, *Smith, Ill. Zool. S. Afr. Pisces,* pl. 3.
Cephalinus granulatus, *Gronov. Syst. ed. Gray,* p. 161.

$$D. \frac{20\text{–}21}{12}. \quad A. \frac{2}{7}.$$

Skin rasp-like. A prominent spine before each eye, and the præorbital with three rough spines anteriorly. The fourth and fifth dorsal spines are the longest, shorter than the head. The spinous dorsal with two black blotches.

Cape Seas.

a. Adult: stuffed. Cape of Good Hope. Presented by Sir A. Smith.—Type of the species.
b. Adult: stuffed. Cape of Good Hope. Purchased of Mr. Warwick.

6. Agriopus alboguttatus.

Kröyer, Naturhist. Tidsskr. 1844, i. p. 226.

D. $\frac{16}{12}$. A. $\frac{1}{8}$.

Skin covered with very minute horny tubercles. The upper surface of the head with three pairs of spines: the first above the snout, the second before, the third behind the orbit. The fourth dorsal spine is the longest, rather shorter than the head. Black: head and fins dotted with white. (*Kröyer.*)

Coast of Chile.

7. Agriopus hispidus.

Jenyns, Zool. Beagle, Fishes, p. 38. pl. 7. f. 2, 2*a*, 2*b*.

D. $\frac{17}{13}$. A. $\frac{1}{8}$.

Minute vomerine teeth. Skin rasp-like. A small spine before each orbit. The fourth and fifth dorsal spines are the longest, shorter than the head. Orange-red: back blackish; fins spotted with black. (*Jen.*)

Peninsula of Tres Montes. Archipelago of Chiloe.

17. PROSOPODASYS*.

Apistus, sp., *Cuv. & Val.*
Prosopodasys, sp., *Cant. Catal.* p. 44.

Head and body more or less compressed, naked, or with minute rudimentary scales. Præorbital and præoperculum armed. The three anterior dorsal spines more or less separated from the others, and forming a distinct division; the remainder of the fin continuous, with nine to twelve spines; the anal with three; no pectoral appendages. Teeth in the jaws, on the vomer, and generally on the palatines (in one species palatines destitute of teeth). No cleft behind the fourth gill.

East Indian Seas. [New Zealand.]

1. Prosopodasys trachinoides.

Apistus trachinoides, *Cuv. & Val.* iv. p. 401. pl. 92. f. 1; *Bleek. Verh. Batav. Genootsch.* xxii. *Sclerop.* p. 8; *Richards. Voy. Samarang, Fishes,* p. 1. pl. 3. f. 3–5; *Cant. Catal.* p. 44.

D. $3\,|\,\frac{12}{4}$. A. $\frac{3}{3}$.

Scales minute, rudimentary. The first three dorsal spines entirely separated from the others. The pectoral reaches to the origin of the anal fin; the third anal spine is the longest. Reddish-brown, finely speckled with brown.

East Indian Seas.

a. Adult. Java. From the Leyden Museum.
b. Adult. Presented by Sir John Richardson.

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* 1. Apistus plagiometopon, *Bleek. Celeb.* iii. p. 753.—Sea of Celebes.

2. Prosopodasys dracæna.

Apistus dracæna, *Cuv. & Val.* iv. p. 403.

B. 7. D. $3 \mid \frac{9}{8}$. A. $\frac{3}{6}$.

Scales minute, rudimentary. The first three dorsal spines isolated by a deep notch from the others, and forming a separate fin. Præorbital and præopercular spines very large. Greyish-brown: fins spotted; a black blotch between the sixth and ninth dorsal spines. (*Cuv.*)

Coast of Malabar.

3. Prosopodasys depressifrons.

Apistus depressifrons, *Richards. Zool. Samar. Fishes,* p. 1. pl. 3. f. 1, 2.
—— binotopterus, *Bleek. Sclerop.* p. 26.

D. $3 \mid \frac{10}{7}$. A. $\frac{3}{5}$.

Scales minute, rudimentary. The first three dorsal spines entirely separated from the others; the pectoral reaches slightly beyond the origin of the anal; the third anal spine is the longest. Interocular space much narrower than the eye; the præorbital and præopercular spines rather small.

Richardson states the Sea of Japan as the habitat of this species, whilst the typical species is marked as coming from Java.

a. Adult. Java.—Type of the species.

4. Prosopodasys asperrimus.

D. $3 \mid \frac{10}{9}$. A. $\frac{3}{6}$. V. $\frac{1}{3}$.

Head and body covered with small prickles; spines of the head very prominent: præorbital with two, suborbital with one, præoperculum with five spines. The first three dorsal spines entirely separated from the posterior ones. Mouth subvertical. The pectorals reach to the vent; the ventrals small. Uniform brown (in a preserved state). Palatine teeth none.

East Indies.

a. From Captain Sir E. Belcher's Collection.

Description of the specimen.—The height of the body equals the length of the head, and is $3\frac{1}{2}$ in the total. The snout is truncated, with the cleft of the mouth nearly vertical. The upper surface of the head is very uneven, and covered with tubercles; the space between the eyes narrow, its width being much less than that of the orbit. The præorbital is armed with a pair of strong spines, pointing downwards; the infraorbital also has a spine, smaller than those of the præorbital, and directed downwards; the præoperculum has five spines, the interoperculum one, the operculum none. The lower posterior angle of the mandibula is very prominent. The three anterior dorsal spines are situated in the middle of the crown of the head, immediately behind the interorbital space, and are entirely separated from the others; the fourth and fifth also are somewhat remote from each other, but connected by a membrane. Caudal rounded. The anal spines are flexible, and the third is the longest. The pectoral is of moderate length, and reaches to the vent; the ventrals are small and short, composed of one pungent spine and three rays.

The colour is now uniform brown.

	lines.
Total length	24
Height of the body	7
Length of the head	7

5. Prosopodasys niger.

Apistus niger, *Cuv. & Val.* iv. p. 415.

D. 3 | $\frac{10}{7}$. A. $\frac{3}{5}$.

No scales; the skin sparingly provided with minute prickles. The first three dorsal spines contiguous with, but rather remote from, the posterior ones. Jaws equal; mouth oblique. The pectorals reach to the vent, the ventrals not; the third anal spine is the longest. Blackish-brown, speckled with black. Palatine teeth.

Coast of Pondichery; Sea of Amboyna.

a. Adult. Amboyna. Purchased of Mr. Frank.

6. Prosopodasys zollingeri.

Apistus zollingeri, *Bleeker, Sclerop.* p. 26, and *Verh. Bat. Genootsch.* xxii. *Sclerop.* p. 8.

D. 3 | $\frac{11}{6}$. V. 1/5.

The first three dorsal spines rather remote from, but contiguous with, the posterior ones. Head acute; the lower jaw prominent; the pectoral as long as the head; the first dorsal spine above the posterior margin of the orbit. (*Bl.*)

East Indian Archipelago.

7. Prosopodasys leucogaster.

Apistus leucogaster, *Richards. Voy. Samar. Zool. Fishes*, pl. 5. f. 1, 2 (pectoral too large); *Bleeker, Amboina*, iii. p. 21.

B. 6. D. 3 | $\frac{10}{8}$. A. $\frac{3}{7}$.

Scales none; the first three dorsal spines contiguous with, but rather remote from, the posterior ones. Cleft of the mouth oblique; the upper maxillary reaches nearly to the vertical from the posterior margin of the eye. Brownish, largely marbled with brown, the spots extending on to the dorsal fin; abdomen white.

Seas of China and Amboyna.

a. Adult. China. Presented by Sir J. Richardson.—Type of the species.

8. Prosopodasys cottoides.

Perca cottoides, *L. Mus. Ad. Fried.* ii. p. 84.
Apistus cottoides, *Cuv. & Val.* iv. p. 410; *Richards. Voy. Samar. Fishes,* p. 4. pl. 3. f. 6, 7 (faulty); *Bleek. Batavia,* p. 459.

B. 7. D. 3 | $\frac{11}{6}$. A. $\frac{3}{7}$.

Scales minute, rudimentary; the first three dorsal spines rather remote from the posterior ones. Cleft of the mouth slightly oblique, wide, the upper maxillary reaching to the vertical from the posterior margin of the eye. Body and fins with small brown spots and rings. No palatine teeth.

Seas of China, Borneo, and Java; New Zealand.

a. Adult. China. Presented by Sir J. Richardson.
b. Adult. New Zealand. From the Haslar Collection.

18. APLOACTIS*.

Aploactis, *Temm. & Schleg. Faun. Japon. Poiss.* p. 51.

Head and body compressed, studded with small prickles; the bones of the head with obtuse protuberances, the præorbital without spine. The three anterior dorsal spines forming a more or less distinct division; the remainder of the fin continuous, with eleven spines. Pectoral appendages none. Teeth in the jaws and on the vomer; none on the palatine bones. Five branchiostegals.

Seas of Japan, China, and Australia.

1. Aploactis aspera.

Aploactis, *Temm. & Schleg. Faun. Japon. Poiss.* p. 51. pl. 22. f. 3.
—— aspera, *Richards. Voy. Sulph. Fishes,* p. 72.

B. 5. D. 3 | $\frac{11}{11}$. A. 12. V. 1/2.

Uniform brown; fins punctulated with black. The dorsal fin begins behind the occiput; the spines of the head obtuse.

Seas of Japan and China.

a. Japan. Purchased of Mr. Frank.

2. Aploactis milesii.

Richardson, Proc. Zool. Soc. 1850, p. 60. pl. 1. f. 1, 2, and *Ann. & Mag. Nat. Hist.* 1851, vii. p. 275.

B. 5. D. $\frac{14}{14}$. A. 12. V. 1/2.

Caudal and pectoral fins with one or two rows of white spots. The dorsal fin begins between the orbits. Head with obtuse knobs instead of spines. (*Rich.*)

King George's Sound.

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* *Aploactis pusillus*, Bleek., is known to me from the "Jahresbericht" only, contained in 'Wiegmann's Archiv,' 1859.

19. TRICHOPLEURA.

Sthenopus*, *Richards. Voy. Samar. Fishes*, p. 10.
Trichopleura, *Kaup, Wiegm. Arch.* 1858, p. 338.

Head and body compressed, naked; the former without spines or protuberances. The three anterior dorsal spines forming a separate division of the fin; the remainder of the fin continuous, with ten spines; pectoral appendages none; all the rays of the fins simple. Teeth in the jaws and on the vomer, none on the palatine bones. Six branchiostegals; no cleft behind the fourth gill.

Sea of China.

1. Trichopleura mollis.

Sthenopus mollis, *Richards. Voy. Samar. Fishes*, p. 10. pl. 2. f. 6, 7.

B. 6. D. 3 | 1 | $\frac{9}{8}$. A. 10. V. 1/2.

Integuments soft, lax, with scattered minute filaments and prickles. The first three dorsal spines forming a separate division of the fin; the fourth spine intermediate, and at some distance from the preceding and the following spines. Head without external ridges and protuberances.

Sea of China.

a. Adult. China. Presented by Sir J. Richardson.—Type of the species.

20. HEMITRIPTERUS.

Hemitripterus, *Cuv. & Val.* iv. p. 268.

Head not compressed, naked, with many cutaneous appendages; armed. Scales none. Two dorsals, the first rather more developed than the second; ventrals enveloped in thick skin like the pectorals; no pectoral appendage. Villiform teeth in both the jaws, on the vomer, the palatine and pterygoid bones. Six branchiostegals. Air-bladder none; pyloric appendages in moderate number.

Atlantic shores of Northern America.

1. Hemitripterus americanus.

Cottus acadianus, *Penn. Arct. Zool.* iii. p. 371.
—— tripterygius, *Bl. Schn.* p. 63.
—— hispidus, *Bl. Schn.* p. 63. pl. 13 (bad).
Scorpæna flava, *Mitch. Trans. Lit. & Philos. Soc. New York*, i. p. 382. pl. 2. f. 8.
—— purpurea et rufa, *Mitch. Amer. Month. Mag.* ii. p. 245.
Hemitripterus americanus, *Cuv. & Val.* iv. p. 268. pl. 84; *Griff. Anim. Kingd.* x. p. 141. pl. 53. f. 3*a*; *Storer, Rep. Mass.* p. 23; *Dekay, New York Fauna, Fishes*, p. 56. pl. 6. f. 16; *Cuv. Règne Anim. Ill. Poiss.* pl. 22. f. 1. H. acadianus, Storer

D. 15 | 12. A. 14. Cæc. pylor. 6. Vert. $\frac{16}{23}$.

The anterior portion of the first dorsal rather remote from the remainder, though continuous. Yellowish or reddish, marbled with brown.

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* Preoccupied.

Coast of New York and further northwards.

21. AMPHIPRIONICHTHYS.

Amphiprionichthys, *Bleeker, Kokos*, iii. p. 172.

Head and body compressed, scaleless. Præorbital, præoperculum and operculum armed; *præoperculum and operculum small, and not covering the gill-membrane.* One dorsal, emarginate between the spinous and soft portions, with eight spines, the anal with two. Villiform teeth in the jaws only. Six branchiostegals.

Sea of the Kokos Islands.

1. Amphiprionichthys apistus.

Bleeker, l. c. p. 173.

$$\text{D. } \tfrac{8}{14}. \quad \text{A. } \tfrac{2}{12}. \quad \text{V. } \tfrac{1}{2\text{–}3}.$$

The upper surface of the head with conical tubercles; cheeks with short tentacles; cleft of the mouth subvertical. Yellowish-brown; head and body punctulated with brown. (*Bl.*)

Sea of the Kokos Islands.

22. SYNANCIDIUM.

Synanceia, sp., *Bl. Schn.* p. 194; *Cuv. & Val.* iv. p. 440.
Synancidium, *Müll. Berl. Abhandl.* 1844, p. 163.

Head irregularly formed, large; scales none; body, and sometimes head and fins, with skinny flaps. The soft dorsal continuous with the spinous, which is formed by thirteen spines. Pectoral appendages none; anal with about five soft rays. Villiform teeth in the jaws and on the vomer; none on the palatine bones. Branchiostegals seven. Air-bladder present, small; pyloric appendages in small number.

East Indian and Australian Seas.

1. Synancidium horridum.

Renard, i. 39. f. 199.
Scorpæna horrida, *L. Syst.* i. p. 453; *Bloch*, t. 183; *Lacép.* iii. p. 261, ii. t. 17. f. 2.
Perca, sp., *Gronov. Zoophyl.* no. 292. tab. 11. f. 1, tab. 12. f. 1, tab. 13. f. 1.
Synanceia horrida, *Bl. Schn.* p. 194; *Cuv. & Val.* iv. p. 440; *Bleeker, Verhand. Batav. Genootsch.* xxii. *Sclerop.* p. 9.
Scorpæna monstrosa, *Gronov. Syst. ed. Gray*, p. 117.
Synanceia trachynis, *Richards. Ann. & Mag. Nat. Hist.* 1842, ix. p. 385.

$$\text{D. } 2\,\Big|\,\tfrac{11}{6}. \quad \text{A. } \tfrac{3}{5}. \quad \text{Cæc. pylor. 3.} \quad \text{Vert. 10/14.}$$

A very large and deep hemispheric groove on the cheek; crown of the head saddle-shaped. Vomerine teeth.

East Indian and Australian Seas (St. Helena).

a. Adult: stuffed. Australia. Presented by J. B. Jukes, Esq.

b. Adult: stuffed. Australia. From Mr. Macgillivray's Collection.
c. Adult. Australia. Presented by Sir J. Richardson.
d, e. Adult: stuffed. Port Essington.—Original specimens of *Synanceia trachynis*, Richardson.
f. Adult. China. Presented by Sir J. Richardson.
g. Adult. India. Presented by General Hardwicke.
h. Adult: stuffed. St. Helena.
i. Adult female: skeleton. From Mr. Frank's Collection.
k. Adult.
l. Half-grown.
m. Half-grown.
n. Intestines of specimen *i*.

Skeleton.—The skull exhibits the same peculiarity in general appearance as the head when covered with the soft parts. The bones of the skull are very strong and solid, many of the sutures being obsolete. The maxillary is styliform, and slightly bent in its upper part, dilated and spatuliform in its lower; the intermaxillary has a broad flat prominence at the descending branch, which is longer than the posterior process. There is a wide free space between the dentary and articular bones of the mandibula, and the former has a deep ovate groove on its outer side. The vomer is anchor-shaped, with the head broad and slightly excavated; the palatine is broad, flat, bifurcate posteriorly, to receive the pterygoid bone between the two branches. The turbinal bones appear to be united with the frontals. The præorbital is very irregularly shaped, having five impressions and two strong spines pointing downwards. The middle infraorbital bone is the narrowest, the posterior exceedingly strong, with a very high prominence, and firmly joined to the præoperculum. The præoperculum forms a strong bony arch with five spinous prominences, the three lower of which are obtuse, whilst the two upper ones, corresponding to two ridges of the infraorbital, project considerably. The operculum has the appearance of a trident, the spines radiating from the basal joint. The suboperculum is attached to the operculum by two processes, which receive the lower spine between them. The interoperculum is very narrow and elongate. The anterior frontals are small, and firmly united to the principal frontals; the latter form the most prominent part of the skull: they are gable-like, elevated above the surface of the skull; on the top and the anterior side they have irregular impressions, and diverge anteriorly, forming a deep longitudinal groove for the processes of the intermaxillary; their posterior side descends abruptly, forming the anterior portion of the saddle-like crown; their orbital margin is more than a semicircle. The bottom of the saddle-like crown is flat, with a slight ridge on each side. The paroccipital has a very high prominence, to which is attached the suprascapula—a solid, subquadrangular bone with irregular impressions; there is a deep square groove beneath the prominence. The scapula has a very strong spine. The humeral arch is exceedingly firm, especially the coracoid, whilst the radius is relatively feeble. Each of the pubic bones is formed by two lamellæ; they are firmly joined to the inner side of the coracoid, and separated from each other by a cleft extending from the symphysis to the anterior extremity. The basal portion of the skull is neither compressed nor globose.

There are ten abdominal and fourteen caudal *vertebræ*, the centre of the five anterior being much compressed in their longitudinal diameter. The hæmal, neural, interhæmal and interneural spines are of moderate strength; the three anterior interneurals are attached to the supraoccipital, which also bears two pairs of ribs. The hæmals of the ninth to the thirteenth vertebræ are compressed, each forming a completely closed arch. The first interhæmal is suspended on the twelfth vertebra.

All the teeth are villiform; those of the pharyngeal bones form small patches.

2. Synancidium erosum.

Synanceia erosa, (*Langsd.*) *Cuv. & Val.* iv. p. 459. pl. 96; *Faun. Japon. Poiss.* p. 45. pl. 17. f. 1.

D. $\frac{13}{9}$. A. $\frac{3}{5}$.

Cheek without groove; crown of the head with a large square cavity. Vomerine teeth. Rose-coloured, marbled with brownish; the pectoral and caudal fins with a white cross-band.

Sea of Japan.

a. Half-grown. Japan. Purchased of Mr. Frank.
b. Adult: dried. Presented by the Zoological Society.
c–e. Adult: dried.

23. SYNANCEIA*.

Synanceia, sp., *Bl. Schn.* p. 194; *Cuv. & Val.* iv. p. 440.

Head monstrous; scales none. One dorsal, with thirteen or sixteen spines; *anal rather short*; pectoral appendages none. Villiform teeth in the jaws; *none on the vomer* or the palatine bones. Branchiostegals seven; air-bladder present; pyloric appendages in small number.

From the Indian Ocean to Polynesia.

1. Synanceia verrucosa.

Synanceia verrucosa, *Bloch, Schn. Syst.* p. 195. t. 45; *Rüppell, N. W. Fische*, p. 109.
Scorpæna brachio, *Lacép.* iii. pp. 259, 272. pl. 12. f. 1.
—— brachiata, *Shaw, Zool.* iv. pt. 2. p. 274.
Synanceia sanguinolenta, *Ehrenb. Pisc.* t. 3.
—— brachio, *Cuv. Règne Anim.*, *Cuv. & Val.* iv. p. 447; *Bleeker, Verhand. Batav. Genootsch.* xxii *Sclerop.* p. 9; *Cuv. Règne Anim. Ill. Poiss.* pl. 25. f. 3; *Agass. Oss. Foss.* iv. p. 200. pl. L.

D. $\frac{13}{6}$. A. $\frac{3}{5}$. Cæc. pylór. 4. Vert. 10/14.

Cheek with a rather small crescent-shaped groove; the interocular space deeply concave. Caudal fin with a whitish band and a whitish margin.

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* 1. Scorpæna bicirrata, *Lacép.* iii. pp. 258, 270, ii. pl. 11. f. 3.—Scorpæna bicapillata, *Shaw. Zool.* iv. p. 273.—Synanceia bicapillata. *Cuv. & Val.* iv. p. 454.—Indian Ocean.

Red Sea; Indian Ocean and Archipelago; Polynesia.

a. Very large specimen: stuffed. Ile de France.
b. Very large specimen: stuffed.
c. Very large specimen. Presented by the Zoological Society.
d. Adult. From the Haslar Collection.
e. Adult. Voyage of the 'Herald.'

2. **Synanceia asteroblepa.**

Richards. Voy. Sulph. Zool. Fishes, p. 69. pl. 39. f. 1–3: *Bleek. Borneo*, vi. p. 419.

D. $\frac{16}{5}$. A. $\frac{3-4}{7-6}$. V. 1/4.

Head with ridges, without a large groove; eyes directed upwards. Blackish-green, dotted with blackish; fins blackish, the pectoral and caudal fins variegated with brownish.

New Guinea; rivers of Borneo.

24. MICROPUS.

Micropus, *Gray, Zool. Misc.* p. 20.
Caracanthus, *Kröyer, Naturhist. Tidsskr.* i. 1844, p. 267.

Head and body very compressed, with small tubercles; snout very short, truncated; no scales; several bones of the head strongly armed; the præorbital and the interoperculum with a strong spine, directed downwards. Two separate or continuous dorsals, the first with eight (seven) spines, the anal with two; no pectoral filament; ventrals rudimentary. Villiform teeth in the jaws only. Branchiostegals five; no aperture behind the fourth gill

Pacific.

1. **Micropus maculatus.**

Micropus maculatus, *Gray, l. c.*
Caracanthus typicus, *Kröyer, l. c.* p. 264.

D. $8 \left| \frac{1}{11-12} \right.$. A. $\frac{2}{12}$. V. 1/2.

Two separate dorsal fins. The height of the body is one-half of the length (without caudal); præoperculum with five spines. Above brown, with whitish spots; below yellow, dotted with blackish, or dotted all over with brown.

Seas of Owaihi and Hao.

a. Type of the species. Presented by Mr. S. Stutchbury.

2. **Micropus unipinna.**

Micropus unipinna, *Gray, l. c.*

D. $\frac{7-8}{12}$. A. $\frac{2?}{11}$. V. 1/2.

Dorsal fins continuous. The height of the body is one-half of the length (without caudal); præoperculum with five spines. Uniform brownish above, or with a dorsal series of whitish spots.

Pacific.

a. Type of the species. Sloane Museum?
b. Presented by Mr. S. Stutchbury.

25. MINOUS.

Minous, *Cuv. & Val.* iv. p. 420.
Corythobatus, sp., *Cant. Catal.* p. 45.

Head and body rather compressed, without any scales. Several bones of the head, and especially the præorbital, armed. One dorsal, with nine to eleven spines, the anal with three; one pectoral filament; pectoral rather elongate. Villiform teeth in the jaws and on the vomer; none on the palatines. Air-bladder present: pyloric appendages in small number.

Indian Ocean and Archipelago.

1. Minous monodactylus.

Scorpæna monodactyla, *Bl. Schn.* p. 194.
Russell, pl. 159.
Apistus minous, *Cuv. Règne Anim.*
—— russellii, *Swains. Nat. Hist. Fishes*, ii. p. 265.
Minous woora, *Cuv. & Val.* iv. p. 421; *Richards. Ichth. China*, p. 213; *Bleeker, Sumatra*, ii. p. 251.
—— monodactylus, *Cuv. & Val.* iv. p. 424. pl. 59. f. 2; *Bleek. Verh. Batav. Genootsch.* xxii. *Sclerop.* p. 9.
Corythobatus woora, *Cant. Catal.* p. 45.
Minous adamsii, *Richards. Voy. Samar. Fishes*, p. 7. pl. 2. f. 4, 5 (pectoral rather too large).

D. $\frac{9-11}{12-9}$. A. 9–11. V. 1/5.

The interocular space nearly equal to the width of the orbit; the præorbital spine rather strong; dorsal spines moderate.

Indian Ocean; East Indian Seas.

a, b. Adult. Madras. Presented by T. C. Jerdon, Esq.
c. Adult. Borneo. Purchased of Mr. Frank.
d. Adult. China.
e. Adult. China. Presented by Captain Sir E. Belcher.—Type of *Minous adamsii*.
f. Half-grown. China. Presented by Captain Sir E. Belcher.
g–o. Adult: dried. From Chinese insect-boxes.

The differences in the number of the fin-rays, and the more or less prominent spines on the bony bridge from the infraorbital to the præoperculum, are not of specific value in this species, as is shown by the specimens in the British Museum. It would, appear, however, from Bleeker's description, that there are other differences between *M. woora* and *monodactylus*. In this case it is very doubtful whether the fish described by Cuvier under the name of *woora*, is identical with *M. woora*, Bleek. The fact that Cuvier ascribes three pyloric appendages to one species, and five to the other, deserves particular attention. *M. adamsii*, Richardson, does not differ from *M. monodactylus*.

2. Minous pusillus.

Temm. & Schleg. Faun. Japon. Poiss. p. 50.

D. $\frac{9}{11}$. A. $\frac{1}{8}$.

The interocular space is two-thirds the width of the orbit; the posterior præorbital spine is feeble, and directed downwards. Dorsal spines exceedingly feeble, and produced into filaments. (*Schleg.*)

Sea of Japan.

Although ignorant of the structure of the gills, I would refer the following species, for the present, to this genus, from which, however, it appears to differ generically in having a distinct anterior division of the spinous dorsal.

3. Minous trachycephalus.

Aploactis trachycephalus, *Bleeker, Celebes*, vi. p. 451.

B. 7. D. 3 | $\frac{8}{9}$. A. $\frac{3}{7}$.

The interocular space concave, one-half the diameter of the eye; head with numerous conical tubercles; the præorbital with a single short spine; the length of the pectoral fins is 3$\frac{2}{5}$ in the total. (*Bl.*)

Sea of Manado (Celebes).

26. PELOR.

Pelor, *Cuv. & Val.* iv. p. 427.

Head irregularly formed; scales none; body, head, and fins with skinny flaps. The three anterior dorsal spines joined by a membrane, and rather remote from the others, which, twelve or fourteen in number, are isolated from one another. Two pectoral appendages, joined at the base by a membrane; ventrals thoracic. Villiform teeth in the jaws, on the vomer and the palatine bones. Branchiostegals seven; air-bladder present, small; pyloric appendages in small number.

Indian Ocean; East Indian Seas.

1. Pelor filamentosum.

Cuv. & Val. iv. p. 428. pl. 94; *Cuv. Règne Anim. Ill. Poiss.* pl. 25. f. 2; *Less. Voy. Coq. Zool. Poiss.* p. 206. pl. 21. f. 1.

D. 3 | 11 | $\frac{1}{8}$. A. 11. Cæc. pylor. 4.

The two upper pectoral rays filiform and prominent. The diameter of the eye is 1$\frac{2}{3}$ in the width of the interocular space; cheeks with a broad groove. Greyish-brown, marbled with brown and powdered with white; the interior margin of the pectoral spotted with blackish.

Ile de France.

a. Adult.

2. Pelor cuvieri.

Pelor cuvieri, *Gray, Ill. Ind. Zool.* ii. pl. 20. f. 2; *Richards. Ichthyol. Sulph.* p. 72. pl. 39. f. 4, and *Ichthyol. China*, p. 212; *Bleeker, Sumatra*, ii. p. 252.
? Pelor sinense, *Cuv. & Val.* ix. p. 468.

D. $3 \,\Big|\, \frac{14}{9}$. A. 13.

None of the upper pectoral rays produced. The diameter of the eye is 3–3½ in the width of the interocular space, which is broad and slightly concave; cheek without groove. The length of the snout is one-half that of the head. Brownish, marbled with darker, and punctulated with bluish.

Seas of China and Sumatra.

a. Adult. India. Presented by General Hardwicke.—Type of the species.
b. Adult. China. Presented by J. R. Reeves, Esq.
c. Young. China. Presented by Sir John Richardson.

3. Pelor maculatum.

Cuv. & Val. iv. p. 434; *Less. Voy. Coq. Zool. Poiss.* p. 210. pl. 20.

D. $3 \,\Big|\, \frac{13}{9}$.

None of the upper pectoral rays produced. Blackish, variegated with black. Three white blotches on the dorsal fin and three on the back; eye with a white ring; head with round white spots; pectoral black, with a white cross-band; caudal with two black and two white bands. (*Cuv.*)

Sea of Waigiou.

4. Pelor didactylum.

Scorpæna didactyla, *Pall. Spicil. Zool.* vii. p. 26. t. 4.
Trigla rubicunda, *Hornst. Nya Handl.* ix. p. 45. t. 3.
Synanceia didactyla et rubicunda, *Bl. Schn.* pp. 195, 196.
Pelor obscurum, *Cuv. & Val.* iv. p. 436; *Less. Voy. Coq. Zool.* ii. p. 211, *Poiss.* pl. 21. f. 2 (not good); *Bleeker, Ceram*, iii. p. 241.
Scorpæna digitata, *Gronov. Syst. ed. Gray*, p. 117.

D. $3 \,\Big|\, \frac{13}{8}$. A. 12.

None of the pectoral rays produced. The interocular space very concave; cheek with a groove. Brown, dotted with white; the dorsal fin with oblique yellow bands; pectoral with a broad yellow cross-band, its interior surface black, with a yellow band and yellow spots; the caudal with two yellow cross-bands.

New Ireland; Ceram.

5. Pelor japonicum.

Pelor japonicum, *Cuv. & Val.* iv. p. 437; *Faun. Japon. Poiss.* p. 44. pl. 18. f. 2.
—— tigrinum, *Richards Ichthyol. Chin.* p. 212.

D. 3 | $\frac{14}{7}$. A. 9.

None of the pectoral rays produced. The diameter of the eye is 2½ in the width of the interocular space, which is very concave. Cheek with a deep ovoid groove. The length of the snout is 2½ in that of the head. Greyish-brown, marbled with reddish-white.

Chinese and Japanese Seas.

a. Fine specimen. Japan.
b. Adult: stuffed. Japan. Purchased of Mr. Frank.
c. Adult: stuffed. Japan.
d. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
e. Adult. Canton. Presented by J. R. Reeves, Esq.
f. Adult: stuffed.

6. Pelor aurantiacum.

Temm. & Schleg. Faun. Japon. Poiss. p. 44. pl. 18. f. 1.

D. 3 | $\frac{14}{7}$. A. 9.

None of the pectoral rays produced. Interocular space very concave; cheek with a deep ovoid groove. The length of the snout is 2½ in that of the head. Orange-coloured, with scattered black dots. (*Schleg.*)

Sea of Japan.

27. CHORISMODACTYLUS.

Choridactylus, *Richards. Voy. Samarang, Fishes,* p. 8.

Head and body rather compressed, scaleless, with skinny flaps. Bones of the head provided with ridges; the præorbital, præoperculum and operculum armed; a groove on the occiput. One dorsal fin, with thirteen spines; the anal with two; *three pectoral appendages.* Ventrals with one spine and five rays. Villiform teeth in the jaws only. Six branchiostegals; air-bladder none; pyloric appendages in small number.

Seas of China and Madras.

1. Chorismodactylus multibarbis.

Choridactylus multibarbus, *Richards. Voy. Samarang, Fishes,* p. 8. pl. 2. f. 1–3.

D. $\frac{13}{9}$ A. $\frac{2}{8}$. V. 1/5.

Head, body, and fins with many delicate tentacles; two larger barbels on the chin. The first three dorsal spines slightly remote from the others; the third, fourth and fifth are the longest; anal spines hidden by the skin. Brown, dotted with white; a whitish band descends obliquely from the fourth, fifth and sixth spines to the belly; caudal with a white cross-band.

Seas of China and Madras.

a. Adult. China. Presented by Sir J. Richardson.—Type of the species.
b, *c*. Adult. Madras. Presented by T. C. Jerdon, Esq.

Third Group. COTTINA.

Triglidæ with the spinous portion of the dorsal fin less developed than the soft and than the anal, with the body naked, or covered with ordinary scales, or incompletely cuirassed with single series of plate-like scales; pyloric appendages in small number. Formula of the vertebræ $\frac{(10)\ 10 \pm x}{14+y}$.

28. PODABRUS*.

Podabrus, *Richards. Voy. Samar. Fishes*, p. 11.

Head and body compressed, without any scales or tentacles; bones of the head not armed, except the operculum and the præoperculum, the latter of which has a recurved spine at its posterior margin. Two dorsals, the first with ten feeble spines; anal rather elongate; no pectoral appendages; ventrals rudimentary, with two soft rays. Small cardiform teeth in the jaws, on the vomer and the palatine bones. Six branchiostegals.

Sea of China.

1. Podabrus centropomus.

Richards. l. c. p. 11. pl. 1. f. 7–11.

D. 10 | 20. A. 18. V. 1/2.

Snout produced, narrow; the upper outline of the back considerably curved, the greatest depth of the body being not much less than the length of the head; the lateral line strongly curved upwards above the pectoral. Coloration uniform (in spirits).

The sea off the Island of Quelpart, in the Straits of Korea.

a. Type of the species. Presented by Captain Sir E. Belcher.

2. Podabrus cottoides.

Richards. l. c. p. 13. pl. 1. f. 1-6.

D. 10 | 19. A. 18. V. 1/2.

Snout of moderate extent; back not elevated, the greatest depth

* The genus *Hoplocottus*, Kaup, in Wiegm. Arch. 1858, p. 339, is a mixture of forms so different that it does not appear advisable to introduce it into the synonymy.

of the body being three-fifths of the length of the head; lateral line slightly curved; a series of black dots along the lateral line.

Sea of China.

a. China. Presented by Sir J. Richardson.
b. China. Presented by Captain Sir E. Belcher.
} —Types of the species.

29. BLEPSIAS.

Blepsias, *Cuv. & Val.* iv. p. 373.

Head and body compressed, the former with tentacles; the præoperculum armed. Skin with small prickles. Two dorsals, the first with seven spines, and much shorter than the second and the anal. *Ventrals thoracic, little developed.* Small teeth in the jaws, on the vomer and on the palatine bones. Branchiostegals six or seven*.

Coast of Kamtschatka.

1. Blepsias cirrhosus.

Trachinus cirrhosus, *Pall. Zoogr. Ross.* iii. p. 237.
Blepsias trilobus, *Cuv. & Val.* iv. p. 375. pl. 90.

B. 6. D. 7 | 24. A. 19. V. 1/3.

The first four dorsal spines separated from the others by a notch; the anal fin lower than the soft dorsal. Body covered with prickles.

Coast of Kamtschatka; Gulf of Georgia.

a, b. Fine specimens. New Orcas Islands, Gulf of Georgia. Presented by the Lords of the Admiralty.

2. Blepsias bilobus.

Blepsias bilobus, *Cuv. & Val.* iv. p. 379; *Cuv. Règne Anim. Ill. Poiss.* pl. 24. f. 2.
Peropus bilobus, *Beech. Voy. Zool. Fishes*, p. 59. pl. 16. f. 3.

B. 7. D. 7 | $\frac{1}{21}$. A. 19. V. 1/3.

The first dorsal not notched, and separated from the second; the anal fin rather lower than the soft dorsal. Body entirely covered with prickles; lateral line spiny.

Coast of Kamtschatka.

a. Type of the species (in spirits; not dried, as stated by Cuvier). Kamtschatka. Presented by A. Collie, Esq.

30. NAUTICHTHYS.

Nautichthys, *Girard in U. S. Pacif. R. R. Exped. Fishes*, p. 74.

Head and body compressed, slightly elongate; the upper surface of the head and the opercles armed. Skin studded with minute prickles.

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* Cuvier states five branchiostegals for *Blepsias cirrhosus*, but he examined dried specimens.

Two dorsals, contiguous at the base, the first much shorter than the second, and elevated anteriorly; no pectoral appendages; ventrals thoracic, elongate. Villiform teeth in the jaws, on the vomer and the palatine bones. Branchiostegals five.

Pacific coasts of the United States.

1. Nautichthys oculo-fasciatus.

Blepsias oculo-fasciatus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1857, p. 202.
Nautichthys oculo-fasciatus, *Girard in U. S. Pacif. R. R. Exped. Fishes*, p. 75.

B. 5. D. 9 | 27. A. 19. V. 1/3.

The three anterior dorsal spines filiform, the posterior rays of the dorsal and anal fins extending beyond the root of the caudal, the ventrals beyond the vent. A black band across the eye and cheeks. (*Gir.*)

Fort Steilacoom, Puget's Sound.

31. SCORPÆNICHTHYS.

Scorpænichthys, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p 131 (not *Bleek.*).

Head not depressed, the upper surface bony, corrugated, with skinny flaps. No groove on the crown. Scales none. Two dorsals, the second rather more developed than the first; the ventrals thoracic, not enveloped in a thick skin; no pectoral appendages. Villiform teeth in the jaws, on the vomer and the palatine bones. Six branchiostegals.

Coast of California.

1. Scorpænichthys marmoratus.

Scorpænichthys marmoratus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, pp. 131, 145, and 1856, p. 133, and *U. S. Pacif. R R. Exped. Fishes*, p. 64. pl. 16. f. 1.
Hemitripterus marmoratus, *Ayres, Proc. Calif. Acad. Nat. Sc.* 1854, p. 4.

B. 6. D. 11 | 19. A. 13. V. 1/5.

Skinny appendages above the orbit, on the snout, and at the posterior extremity of the maxillary bones. Præoperculum with two moderate spines. Brown, marbled with black. (*Gir.*)

Coast of California.

32. COTTUS*.

Cottus, sp., *Artedi, Genera*, p. 48.
Cottus, *Cuv. & Val.* iv. p. 142.
Cottus et Phobetor, *Kröyer, Naturhist. Tidsskr.* i. 1844, p. 263.

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* 1. Cottus platycephalus, *Pall. Zoogr.* p. 135; *Cuv. & Val.* iv. p. 177.—Kamtschatka.
2. —— mertensii, *Cuv. & Val.* viii. p. 496.—Kamtschatka.

3.

Boreocottus, Porocottus, et Ceratocottus, *Gill, Proc. Acad. Nat. Sc. Philad.* 1859, p. 165 &c.
Aspicottus, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 130.
Cottus et Acanthocottus, *Girard, Monograph of the Cottoids in Smithson. Contrib. Knowl.* iii. 1852.
Leiocottus, *Girard, Proc. Acad. Nat. Sc. Philad.* 1856, p. 133, and *U. S. Pacif. R. R. Exped. Fishes*, p. 62.

Head broad, depressed, rounded in front; body subcylindrical, compressed posteriorly; head and body covered with a soft and scaleless skin; lateral line present. Two dorsals, of moderate height. Pectoral rounded, with some or all the rays simple. Ventrals thoracic. Jaws and vomer with villiform teeth; (vomerine teeth sometimes absent;) none on the palate. Air-bladder none; pyloric appendages in moderate number.

Antipodes of *Notothenia* and *Harpagifer*; inhabiting the northern Seas of Europe and North America, extending to the coasts of France. Fresh waters of Europe, Northern Asia and North America.

The species of this genus may be arranged as follows:—

A. Species with a simple præopercular spine or spines, and with vomerine teeth.

B. Species with antler-like processes at the præopercular spine.
    I. With vomerine teeth.
    II. Without vomerine teeth.

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3. Cottus marmoratus, *Cuv. & Val.* viii. p. 497.—Kamtschatka.
4. —— villosus, *Pall. Zoogr.* p. 129; *Cuv. & Val.* iv. p. 196.—Kamtschatka.
5. —— æneus, *Mitchill, Trans. Lit. & Philos. Soc. New York*, i. p. 380; *Cuv. & Val.* iv. p. 189; *Storer, Rep. Mass.* p. 20; *Dekay, New York Fauna, Fishes*, p. 52. pl. 6. f. 19.—Coast of New York.—Ten anal rays, as stated by Dekay in the text, would be a good distinctive character; but the figure, given by the same author, represents thirteen (!).
6. —— scorpioides, *Fabric. Faun. Grönl.* p. 157; *Cuv. & Val.* iv. p. 187.—Coast of Greenland.
7. —— wilsonii, *Girard, Smith's Contr. l. c.* p. 42. pl. 1. f. 3 & 4, pl. 3. f. 14–17.—Pennsylvania.
8. —— meridionalis, *Girard, Smith's Contr. l. c.* p. 47. pl. 1. f. 9 & 10, and *Proc. Bost. Soc. Nat. Hist.* iii. 1850, p. 189, and *Proc. Amer. Assoc. Adv. Sc.* ii. 1850, p. 410.—James River (Virginia).
9. —— viscosus, *Haldem. Suppl. Monogr. Limn. &c.* 1840, p. 3; *Girard, Proc. Amer. Assoc. Adv. Sc.* ii. 1850, p. 411, and *Proc. Bost. Soc. Nat. Hist.* iii. 1850, p. 189, and *Smithson. Contrib. l. c.* p. 51. pl. 2. f. 1, 2, pl. 3. f. 1–9.—Pennsylvania and Maryland.
10. —— formosus, *Girard, Smithson. Contrib. l. c.* p. 58.—Lake Ontario.
11. Acanthocottus ocellatus, *Storer, Bost. Journ.* vi. p. 253.—Labrador.
12. Boreocottus axillaris, *Gill, Proc. Acad. Nat. Sc. Philad.* 1859, p. 166.—Behring's Straits.
13. Porocottus† quadrifilis, *Gill, l. c.*—Behring's Straits.
14. Cottus polaris, *Sabine, App. Parry's First Voyage*, p. 213; *J. C. Ross, App.* p. 53; *Richards. Faun. Bor. Amer. Fishes*, p. 43.—Coast of Boothia.

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† A single hooked præopercular spine is attributed to this species: but it is not evident whether the spine is simply curved, or provided with an antler-like process.

A. Species with a simple præopercular spine, and with vomerine teeth.

1. Cottus gobio.

Βοιτος (Κοίτος), *Aristot.* iv. c. 8.
Cottus, (*Gaza, Aristot.*) *Rondel.* ii. p. 202.
Cottus s. Gobio fluviatilis capitatus, *Gesner,* f. 162 *a*; *Aldrov.* v. c. 28. p. 613; *Willughby,* p. 137. tab. H. 3. f. 3; *Ray,* p. 76.
Cottus, sp. 1, *Artedi, Gen.* p. 48, *Spec.* p. 82, *Synon.* p. 76.
—— gobio, *L. Syst. Nat.* i. p. 452; *L. Gm.* i. p. 1211; *Gronov. Mus. Ichthyol.* ii. p. 14; *Bl.* taf. p. 39. f. 1, 2; *Bl. Schn.* p. 61; *Lacép.* iii. p. 252; *Donov. Brit. Fishes,* iv. pl. 80; *Pall. Zoogr.* iii. p. 126; *Meid.* pl. 17; *Jurine, Poiss. du Lac Leman,* pl. 2; *Cuv. & Val.* iv. p. 145; *Ekström, Fische Mörkö,* p. 167; *Fries och Ekstr. Skand. Fisk.* p. 34. t. 7. f. 2; *Yarrell, Brit. Fishes,* i. p. 71; *Günther, Neckarfische,* p. 17; *Gronov. Syst. ed. Gray,* p. 103; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 376.
—— lævis, *Marsigli, Danub.* iv. tab. 24. f. 2.
Percis, sp., *Klein, Miss.* v. p. 43. no. 17.
Cottus minutus, *Pall. Zoogr.* iii. p. 145. pl. 20. f. 5, 6; *Cuv. & Val.* iv. p. 152.
—— affinis, *Heckel, Ann. Wien. Mus.* ii. p. 145. taf. 8.
—— microstomus, *Heckel, l. c.*; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 377; *Heckel & Kner, Süsswasserf.* p. 32.
—— ferrugineus, *Heckel & Kner, Süsswasserf.* p. 34.

D. 6–8 (9) | 16–17. A. 12 (–14). Cæc. pylor. 4 (3–5).
Vert. 10/23.

Skin smooth. No spines on the head, except on the præoperculum, which is armed posteriorly with a small curved spine, and on the suboperculum, the spine of which is still smaller. The lateral line runs nearly along the middle of the body, and terminates in the middle of the root of the caudal. Vent rather nearer to the snout than to the tip of the caudal[*]; the ventrals do not extend to the vent; the height of the first dorsal is more than one-half of that of the second. Pectoral, dorsal, caudal, anal, and sometimes the ventral fins dotted with blackish.

Fresh waters of Europe, and probably of Northern Asia.

I. Pectoral fins with 7 or 8 forked rays: *Cottus gobio,* Valenc.—France.

II. Rays of the pectorals simple.

A. Rays of the ventrals forked: *Cottus gobio,* Artedi, L., Ekstr., or *Cottus affinis,* Heck.—Scandinavia.

a. Many specimens. Gotha River, Sweden.

B. Rays of the ventrals simple.—Germany; England.

b. Adult. Austria.
c. Adult. Dalmatia.

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[*] Sir John Richardson (*Faun. Bor. Amer. Fish.* p. 42), and Girard (*l. c.* p. 36), from him, state, in the description of *Cottus cognatus*:—"The anus, situated precisely as in *gobio,* is rather nearer to the snout than to the insertion of the caudal." This is wrong, with regard to the European *C. gobio*; and if it be correct as to *C. cognatus,* both fishes must be different.

d–f. Adult. Danube (Ulm). From the Stuttgart Museum.
g. Adult. Neckar. From the Stuttgart Museum.
h. Adult: skeleton. Neckar. From Dr. A. Günther's Collection.
i, k. Large skulls. Neckar. From Dr. A. Günther's Collection.
l. Adult. Cambridge. Mus. Leach.
m. Adult: not good state. London. Presented by W. Yarrell, Esq.
n. Adult: not good state. London. Presented by W. Yarrell, Esq.
o. Adult. Devon. Mus. Leach.
p–t. Half-grown and adult.
u. Half-grown.

On the varieties and the anatomy see *Günther, Neckarfische*, pp. 20–28.

2. Cottus pœcilopus.

Cottus pœcilopus, *Heckel, Ann. Wien. Mus.* ii. 1839, taf. 8. f. 1, 2*; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 377.
—— gobio, var., *Gthr. Neckarf.* p. 25.

D. 8–9 | 16–18. A. 13–14. Cæc. pylor. 4–5.

Skin smooth. No spines on the head, except on the præoperculum, which is armed with a small curved spine, and on the suboperculum, the spine of which is still smaller. Lateral line above the middle of the body, not reaching to the caudal, and terminating near the extremity of the dorsal. Vent in the middle of the distance between the snout and the root of the caudal. The second dorsal and the anal lower than the corresponding part of the body; the origin of the anal falls vertically below the third dorsal ray. The ventrals extend to the vent. Fins dotted with brown.

Karpathians; Pyrenees.

a. Fine specimen. Hungary.

3. Cottus cognatus.

Richards. Faun. Bor. Amer. iii. p. 40; *Heckel, Ann. Wien. Mus.* ii. 1836, p. 149; *Girard, Proc. Amer. Assoc. Adv. Sc.* ii. p. 410, and *Proc. Bost. Soc. Nat. Hist.* 1850, iii. p. 189, and *Smithson. Contrib. l. c.* p. 41.

D. 8 | 18. A. 14. Cæc. pylor. 4.

Skin smooth. No spines on the head, except those of the præ- and suboperculum, as in *C. gobio*. The lateral line is nearer to the ridge of the back than to the belly. Vent nearer to the snout than to the insertion of the caudal. The origin of the anal falls in the vertical from the sixth dorsal ray. (*Rich.*)

Great Bear Lake.

4. Cottus gracilis.

Cottus gobio, *Ayres, Bost. Journ. Nat. Hist.* v. 1845, p. 121. pl. 11.
—— gracilis, *Heck. Ann. Wien. Mus.* ii. 1837, p. 148; *Girard, Proc. Amer. Assoc. Adv. Sc.* ii. 1850, p. 411, and *Proc. Bost. Soc. Nat. Hist.* iii. 1850, p. 189, and *Smithson. Contrib. l. c.* p. 49. pl. 1. f. 11, 12.

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* The figure given in *Heckel and Kner, Süsswasserfische*, p. 31, represents the lateral line faulty.

Uranidea quiescens, *Dekay, New York Faun.* 1842, p. 61. pl. 5. f. 14.
? Cottus gobio, *Kirtl. Bost. Journ. Nat. Hist.* v. 1847, p. 342.
? Cottus bairdii, *Girard, Proc. Amer. Assoc. Adv. Sc.* ii. 1850, p. 410, and *Proc. Bost. Soc. Nat. Hist.* iii. 1850, p. 189, and *Smithson. Contr. l. c.* p. 44. pl. 1. f. 5, 6.

D. 8 | 16. A. 11–12.

Skin smooth; armature of head as in *C. gobio.* The lateral line does not extend to the caudal; the vent is nearer to the snout than to the extremity of the caudal fin; the first dorsal fin very low, its height being less than one-half of that of the second; the pectoral extends somewhat beyond the origin of the anal; the origin of the anal falls vertically below the third dorsal ray. Dorsal, pectoral, caudal, and anal fins banded or spotted.

Rivers of Ohio, Massachusetts, Connecticut, and New York.

a. Half-grown. Boston. Presented by B. Winstone, Esq.

5. **Cottus richardsonii.**

Agass. Lake Superior, 1850, p. 300; *Girard, Proc. Amer. Assoc. Adv. Sc.* 1850, p. 410, and *Proc. Bost. Soc. Nat. Hist.* iii. 1850, p. 189, and *Smithson. Contrib.* p. 39. pl. 1. f. 1, 2, pl. 3. f. 18–21.

D. 8 | 18. A. 14.

Skin smooth; armature of head as in *C. gobio.* Pectorals shorter than the head; the vent is in the middle of the distance between the extremities of the snout and of the caudal fin; the origin of the anal falls vertically below the third dorsal ray.

Lake Superior.

6. **Cottus alvordii.**

Girard, Smithson. Contrib. l. c. p. 46. pl. 1. f. 7, 8.

D. 7 | 16. A. 13.

Skin smooth; armature of head as in *C. gobio,* with a second additional, very small præopercular spine beneath the larger one. The lateral line disappears under the middle of the second dorsal; the vent is nearer to the snout than to the root of the caudal fin. The first dorsal is about half as high as the second; the pectoral extends beyond the origin of the anal; the origin of the anal falls vertically below the third dorsal ray. Fins yellowish, the first dorsal with some blackish spots. (*Gir.*)

Streams emptying into Lake Huron.

7. **Cottus franklinii.**

Agass. Lake Superior, 1850, p. 303; *Girard, Proc. Amer. Assoc. Adv. Sc.* ii. 1850, p. 411, and *Proc. Bost. Soc. Nat. Hist.* iii. 1850, p. 189, and *Smith's Contrib. l. c.* p. 53. pl. 2. f. 5, 6, pl. 3. f. 10–13.

D. 8 | 17. A. 12.

Skin smooth; armature of the head as in *C. gobio.* The lateral line disappears under the middle of the second dorsal fin; the vent is nearer to the base of the caudal fin than to the tip of the snout. The first dorsal is nearly as high as the second, the pectoral does not reach to the anal, and the origin of the anal falls vertically below the fourth dorsal ray.

Lake Superior.

8. Cottus boleoides.

Girard, Proc. Amer. Assoc. Adv. Sc. ii. 1850, p. 411, and *Proc. Bost. Soc. Nat. Hist.* iii. 1850, p. 189, and *Smithson. Contrib. l. c.* p. 56. pl. 2. f. 7, 8.

D. 8–9 | 17. A. 11–12.

Skin smooth. Armature of the head as in *C. gobio.* Lateral line above the middle of the body, not reaching to the caudal, and terminating below the dorsal. Vent in the middle of the distance between the snout and the root of the caudal; the second dorsal and the anal higher than the body between them; the ventrals extend to, or slightly beyond, the vent; the pectoral beyond the third ray of the anal. Pectoral, dorsal, and caudal fins strioiated and dotted with blackish. (*Gir.*)

Along the western slope of the Green Mountains.

9. Cottus scorpius.

Cottus, sp. 3, pt., *Artedi, Gen.* p. 49, *Spec.* p. 86; *Gronov. Zoophyl.* no. 268.

—— scorpius, pt., *L. Syst.* i. p. 452; *Gronov. Syst. ed. Gray,* p. 102.

Corystion, sp., *Klein, Miss.* iv. p. 47. no. 11. tab. 13. f. 2, 3.

Edwards, Gleanings, pl. 284 (lower figure; faulty).

Cottus scorpius, *Bloch,* taf. 40; *Bl. Schn.* p. 60; *Lacép.* iii. p. 236; *Donov. Brit. Fishes,* ii. pl. 35; *Cuv. & Val.* iv. p. 160; *Ekström, Fische Mörkö,* p. 171; *Fries och Ekstr.* p. 23. pl. 5. f. 1, 2; *Parn. Fish. Frith of Forth,* p. 23; *Yarrell,* i. p. 75 (not *Pallas*).

D. 10 | 14. A. 11–12. Cæc. pylor. 9. Vert. $\frac{12-13}{22}$.

Two small spines above the snout and four more or less obtuse tubercles on the crown; three præopercular spines, two of which are at the angle, the upper one the longest, rather less than the width of the eye. The height of the first dorsal is less than the length of the maxillary bone. Skin naked, in some individuals with several granulated plates. The pectoral does not reach to the origin of the anal. Above blackish, marbled with greyish; the soft dorsal and anal fins with oblique blackish bands; the caudal with vertical bands.

Coasts of Great Britain; German Ocean; Baltic.

a. Large female. England. Presented by W. Yarrell, Esq.

b. Large female: skin. South Devon. From Mr. Yarrell's Collection as "Four-horned *Cottus*."

c. Adult. Mouth of the Thames. Presented by T. Henslow, Esq.

d. Adult. Brighton. Presented by Dr. A. Günther.

e. Adult: stuffed. Plymouth. Presented by Lieutenant H. F. Spence, R.N.

f, g. Large specimens: stuffed. Frith of Forth.
h–k. Adult: skins. England. From Mr. Yarrell's Collection.
l. Adult. River Gotha, Sweden. From Mr. Lloyd's Collection.
m. Adult female: skeleton. River Gotha, Sweden. From Mr. Lloyd's Collection.
n, o. Very large specimens. Baltic Sea. From the Haslar Collection.
p. Very large specimen: skeleton.
q. Adult.
r, s. Half-grown.
t. Half-grown.
u. Adult: stuffed.
v. Intestines of specimen *m.*

Skeleton.—The greater part of the upper surface of the skull is formed by the principal frontal bones, which have a crescent-shaped incisure on the side for receiving the eye. The space between the eyes is concave, and its width is two-thirds of the distance between the upper posterior angles of the orbits; these angles are indicated by a striated protuberance of the bone. The crown of the head is very broad and flat; an obtuse ridge runs from the protuberance mentioned to the insertion of the suprascapula, and separates the crown from the lateral parts of the head; a similar transverse ridge crosses the supraoccipital. A part of the ethmoid, which is intercalated between the frontal bones, is quite free; anteriorly it is bifurcate. The turbinal bones are armed with a spine; the palatine bones oblong, toothless. The vomer is anchor-shaped; its anterior arms are provided with a band of villiform teeth, bent at an obtuse angle; its posterior part is broad anteriorly, and tapers posteriorly into an obtuse point. The basisphenoid is flat beneath, very long, reaching nearly as far forwards as the vomer; there is no pit between the basioccipital and the basisphenoid. The basal portion of the brain-capsule is slightly convex, broad, and depressed.

The upper maxillary bone is rather elongate, styliform anteriorly, and spatuliform behind; it has no supplementary bone. The intermaxillary is one-third shorter; its posterior margin is slightly flattened and produced; each posterior process is divided into two, namely into a broad, oblong, exterior part, and a longer interior one which is pointed. The dentary bone of the mandibula is deeply forked; only the inferior part is joined to the articular, the superior being quite free. The articular bone is composed of three processes: the middle and longest joins the dentary, the two others being free; the one is styliform and points upwards, the other is broad and directed downwards. The dentary, like other bones of the skull, has a muciferous channel, as in a great many—more or less in all—*Acanthopterygii*, and therefore not a peculiarity of the Cottoids.

The infraorbital bridge is formed by three oblong flat bones with several mucous pits. The opercles are composed merely of ridges, terminating in, or armed with, spines; the connecting bony parts between the ridges are feeble and thin.

Each *os innominatum* is composed of three lamellæ, the inferior of which is the least developed; the two others form together a concave longitudinal groove. There is a wide channel, completely closed, along all the longitudinal axis of the bone.

Thirty-five *vertebræ*; the extent of the abdominal portion cannot be ascertained in the present skeleton.

10. Cottus grœnlandicus.

Cottus scorpius, *Fabric. Faun. Grœnl.* p. 156; *Faber, Fische Islands,* p. 120.

—— grœnlandicus, *Cuv. & Val.* iv. p. 156; *Richards. Faun. Bor. Amer.* iii. pp. 46, 297. pl. 95. f. 2; *Storer, Rep. Mass.* p. 16; *Dekay, New York Fauna, Fishes,* p. 54. pl. 4. f. 10.

? Cottus porosus, *Cuv. & Val.* viii. p. 498; *Richards. Faun. Bor. Amer. Fishes,* p. 47.

Cottus variabilis, *Ayres, Proc. Bost. Soc. Nat. Hist.* 1842, p. 68, and *Bost. Journ.* iv. 1843, p. 259.

Acanthocottus variabilis, *Gir. Bost. Journ.* vi. p. 248

D. 10 | 16. A. 12–13. Cæc. pylor. 7.

Two small spines above the snout; four more or less obtuse tubercles on the crown; the quadrangular space between them rather longer than broad; three præopercular spines, two of which are at the angle; the upper one is the longest, rather less than the width of the eye. The height of the first dorsal is less than the length of the maxillary bone: the ventral terminates at a great distance from the vent; the pectoral does not reach to the origin of the anal. Skin above the lateral line generally with granulated plates. The first dorsal blackish, marbled with lighter, and with a whitish posterior margin; the soft dorsal and anal with broad oblique brown bands, the caudal with vertical ones.

Arctic Seas of America.

Var. *α*. Sides of the belly with large white spots.

a. Large specimen. Banks of Newfoundland. From the Haslar Collection.
b. Large specimen. Banks of Newfoundland. From the Haslar Collection.
c. Adult. From the Haslar Collection.
d. Very large specimen: stuffed. Greenland.

Var. *β*. Sides irregularly marbled.

e. Large specimen. Boston. Presented by W. Winstone, Esq.
f, *g*. Adult: dried. Greenland. Presented by the Zoological Society.
h. Half-grown: dried.

11. Cottus pachypus.

D. 9 | 16. A. 12 (–14)

Two small spines above the snout, an obtuse one above each orbit, and a pair of obtuse prominences on the occiput. The impression on the crown becomes narrower posteriorly, and is nearly twice as long as broad. Three præopercular spines, two of which are at the angle; the upper is the longest, its length being equal to the diameter of the eye, but less than the width between the orbits. The height of the first dorsal is somewhat more than the length of the maxillary bone; the ventral terminates at a great distance from the vent, and the pectoral does not reach to the anal. Skin above the lateral line with smooth warts. Brownish, spotted with darker (colours faded).

Port Leopold.

a. Adult. Port Leopold. From the Haslar Collection.
b. Young. Port Leopold. From the Haslar Collection.

Description of the specimen.—The greatest height of the body, in front of the dorsal, is $4\frac{2}{3}$ in the total length; its greatest width, behind the pectoral, four times. The tail tapers much posteriorly, and its height, before the caudal, is twenty-one times in the total length. The head is moderately broad and depressed; its length is $3\frac{2}{3}$ in the total. The cleft of the mouth is moderate, the maxillary reaching to the vertical from the centre of the eye; the snout is not very obtuse, and the upper jaw slightly overhangs the lower; there is a pair of small spines above the snout. The space between the eyes is slightly concave, and its width rather more than the horizontal diameter of the eye; there is an obtuse protuberance above the posterior angle of the orbit, from which a slight ridge proceeds to the occipital protuberance; the latter is very little prominent, and furnished with a small skinny tentacle. The impression between these two pairs of protuberances is shallow, and becomes narrower posteriorly, being nearly twice as long as broad. The præoperculum is armed with three spines, two of which are opposite the infraorbital, the third being situated at the inferior extremity of the bone, and pointing downwards. The suboperculum has a single spine anteriorly, directed downwards; throat without spines.

The spinous dorsal begins at a distance from the head which is rather less than the length of the impression of the crown; it is not continuous with the soft. The fourth spine is the longest, its length being somewhat more than that of the maxillary bone, and a little less than that of the ninth ray. The caudal has the posterior margin slightly convex, and its length is $6\frac{1}{2}$ in the total. The anal is formed by twelve rays, and begins in the vertical from the fifth dorsal ray, and terminates a little before the opposite fin; its height equals that of the spinous dorsal. The pectoral is composed of sixteen simple rays, and reaches to the vent, which is situated nearly in the middle of the total length. The root of the ventrals falls behind that of the pectoral; they terminate at a great distance from the vent, and are composed of one spine and three rays. The spine is enveloped in the same membrane with the first ray; the middle ray is the longest, flat and compressed like the interior.

The lateral line is continued to the caudal, and is composed of elongate bony tubes, thirty-eight in number. This specimen is nearly entirely smooth, exhibiting, however, some flat and smooth warts above the lateral line; it is a female.

The young specimen differs from the adult one in having fourteen anal rays.

The colours have somewhat faded; the upper parts are brown, with some darker spots; the pectoral, dorsal, and caudal fins appear to have been spotted, the spots being arranged in bands. The lower part of the sides with several white spots.

	inches.	lines.
Total length	7	1
Length of the head	1	11
Greatest height of the body	1	6
Smallest height of the tail	0	4
Greatest width of the body	1	9
Width of the space between the eyes	0	5
Horizontal diameter of the eye	0	4
Length of the fourth dorsal spine	0	10
——— of the ninth dorsal ray	0	11
——— of the sixth anal ray	0	10
——— of the caudal	1	1
——— of the pectoral	1	6
——— of the ventral	1	3

12. Cottus labradoricus.

Acanthocottus labradoricus, *Girard, Bost. Journ. Nat. Hist.* vi. 1850, p. 247. pl. 7. f. 3.

B. 6. D. 8 | 17. A. 14. V. 1/3.

Two spines above the snout, one above the orbit, and two pairs on the crown. Four præopercular spines, two of which are situated at the angle, the upper one being the longest, rather less than the width of the eye. A series of granulated plates above the lateral line; back with scattered bony plates. (*Gir.*)

Coast of Labrador.

13. Cottus octodecim-spinosus.

Scorpius virginianus, *Willughby, App.* p. 25. pl. 10. f. 15.

Cottus scorpius, *Schoepff, Schrift. Naturf. Freunde Berl.* viii. p 145.

—— octodecimspinosus, *Mitchill, Trans. Lit. & Philos. Soc. New York,* i. p. 380; *Cuv. & Val.* iv. p. 181; *Richards. Faun. Bor. Amer. Fishes,* p. 46.

—— virginianus, *Storer, Rep. Mass.* p. 18; *Dekay, New York Fauna, Fishes,* p. 51. pl. 5. f. 13.

Acanthocottus virginianus, *Gir. Smithson. Contrib. l. c.* pl. 3. f. 26–29, f. 46–48.

D. 9 | 16. A. 13–14. Cæc. pylor. 6. Vert. 13/23.

Two spines above the snout and four on the crown, the latter placed in a quadrangle, much longer than broad. Three præopercular spines, the upper of which is one-half longer than the diameter of the eye. The height of the spinous dorsal is rather more than the length of the maxillary bone. Skin smooth; along the lateral line narrow bony plates. Body marbled with brown; the first dorsal blackish, with whitish spots; the other fins with brownish spots, more or less confluent into bands.

Atlantic coasts of the northern parts of North America.

a. Adult: stuffed. N. America. Presented by E. Doubleday, Esq.
b. Adult: skin. New York. From Dr. Parnell's Collection.

14. **Cottus mitchilli.**

Cottus scorpio?, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 381.
—— mitchilli, *Cuv. & Val.* iv. p. 188; *Dekay, New York Fauna, Fishes*, p. 53. pl. 17. f. 47.

D. 10 | 14. A. 11.

Two spines above the snout; four on the præoperculum, the upper one much shorter than the diameter of the eye. The distance between the eyes is one-half of their diameter; ventral fin reaching nearly to the vent. Yellowish, with confluent bars and blotches over the back and sides; all the fins with interrupted black bars. (*Dek.*)

Coast of New York.

15. **Cottus bubalis.**

Cottus, sp. 3, pt., *Artedi, Gen.* p. 49, *Spec.* p. 86; *Gronov. Zoophyl.* no. 268.
Cottus scorpius, pt., *L. Syst.* i. p. 452; *Gronov. Syst. ed. Gray*, p. 102.
Scorpius marinus, *Schonev. Ichth.* p. 67. tab. 6.
Tonning in Trondhj. Selsk. Skr. ii. p. 345. tab. 13, 14.
Cottus bubalis, *Euphrasen, N. Schwed. Abhandl.* vii. p. 64. t. 3. f. 2, 3; *Bl. Schn.* p. 62; *Cuv. & Val.* iv. p. 165. pl. 78; *Ekström, Fische Mörkö*, p. 182; *Fries och Ekstr.* p. 27. t. 6. f. 1, 2; *Yarrell, Brit. Fish.* 2nd edit. i. p. 78; *Parn. Fishes Frith of Forth*, p. 25; *Owen, Osteol. Catal.* i. p. 55.
Aspicottus bubalis, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 130.
—— bison, *Girard, l. c.*

D. 8 | 11–12. A. 9. Cæc. pylor. 8. Vert. $\frac{12}{17}$.

Two small spines above the snout; behind the eyes two obtuse parallel ridges, including a quadrangular space much longer than broad. Four præopercular spines, two of which are at the angle, and a third in the middle of the posterior margin of the bone; the uppermost is longer than the diameter of the eye. The ventral fin terminates at some distance from the vent, the pectoral reaches to the origin of the anal. Lateral line armed with bony plates. Head, body, and fins variegated with blackish.

a. European variety. The ridges on the bones of the skull covered with skin, or smooth. Coasts of France and Great Britain; German Ocean; Baltic.

a–c. Adult and half-grown. Brighton. Presented by Dr. A. Günther.
d–g. Adult. Falmouth. Purchased.

h, i. Adult: stuffed. Plymouth. Presented by Lieutenant H. F. Spence, R.N.
k, l. Half-grown: stuffed. Plymouth. Presented by Lieutenant H. F. Spence, R.N.
m. Half-grown. Berwick-on-Tweed. Presented by Dr. G. Johnston.
n, o. Adult. Devonshire coast.
p–s. Adult, half-grown, and young. Wales. Presented by Mrs. Grey.
t–v. Half-grown. S. Wales. Presented by J. Stokes, Esq.
w. Many skins. River Tamar. From Mr. Yarrell's Collection.
x–z. Adult and half-grown. Frith of Forth.
α. Adult: stuffed. Frith of Forth. Mus. Leach.
β. Adult: skin. Frith of Forth.
γ. Half-grown. Polperro. Presented by J. Couch, Esq.
δ. Adult.
ε. Half-grown.
ζ. Half-grown.
η, θ, ι. Adult and half-grown. Purchased of Mr. Stevens.
κ. Adult: skeleton. Falmouth.

β. American variety. The ridges of the bones of the head tubercular, not covered with skin. Coast of California; Gulf of Georgia.

λ. Fine specimen. New Orcas island (Gulf of Georgia). Presented by the Lords of the Admiralty.

The *skeleton* is very similar to that of *C. scorpius,* and differs from it chiefly by the narrowness of the upper parts of the skull. The space between the orbits is very concave, and its width is two-fifths only of the distance between the upper posterior angles of the orbits. The longitudinal ridges on the crown of the head are rather stronger, and the space between them is twice as long as broad.

The number of the *vertebræ* also is remarkably different, there being twelve abdominal and seventeen caudal.

16. Cottus jaok.

Cottus scorpius, *Pall. Zoogr.* iii. p. 131.
? Myoxocephalus stelleri, *Tiles. Mém. Acad. Pétersb.* 1811, iv. p. 273.
Cottus jaok, *Cuv. & Val.* iv. p. 172.

D. 7 | 15. A. 14.

Two small spines above the snout; crown with some slight granulations instead of tubercles; three præopercular spines, two of which are at the angle, the upper one the longest, rather less than the width of the eye. Above and below the lateral line granulated plates. The height of the first dorsal is much less than the length of the maxillary bone. Body and pectoral fins spotted with brown; the second dorsal, caudal, and anal with brown bands.

Coasts of Kamtschatka

17. Cottus polyacanthocephalus.

Pallas, Zoogr. p. 133. pl. 23; *Cuv. & Val.* iv. p. 177.

D. 10 | 15. A. 12.

Crown with four groups of pointed granulations; a similar group above the temporal region; three præopercular spines, two of which are at the angle, the upper one extending nearly as far backwards as that of the operculum. Skin naked. Brownish, with lighter spots; fins with irregular bands.

N.W. coast of America.

18. Cottus quadricornis.

Cottus, sp. 2, *Artedi, Genera,* p. 48, and *Spec.* p. 84; *Gronov. Zoophyl.* no. 272.

Cottus quadricornis, *L. Syst.* i. p. 451; *Bl.* t. 108; *Bl. Schn.* p. 62; *Lacép.* iii. p. 241; *Cuv. & Val.* iv. p. 168; *Ekström, Fische Mörkö,* p. 178; *Fries och Ekstr.* p. 30. t. 7. f. 1; *Yarr. Brit. Fishes,* i. p. 83; *White, Catal. Brit. Fishes,* p. 7; *Gronov. Syst. ed. Gray,* p. 102; ? *Pall. Spicil. Zool.* viii. p. 25 (not *Parry*).

D. 9 | 14. A. 13–15. Cæc. pylor. 7. Vert. 40.

Two small spines above the snout; four very prominent and rough tubercles on the crown, the quadrangular space between them rather longer than broad; four præopercular spines, the uppermost of which is the longest, and about equal to the diameter of the eye. The height of the first dorsal is much less than the length of the maxillary bone. The ventral terminates at a great distance from the vent, whilst the pectoral extends nearly to it. One or more series of granular tubercles, parallel to the lateral line. Greyish; fins sometimes spotted.

British Channel; German Ocean; Baltic.

a. Adult. London market. Presented by Dr. J. E. Gray.
b, c. Adult. From the Haslar Collection.

19. Cottus hexacornis.

Richards. Franklin Journ. p. 726, and *Faun. Bor. Amer. Fishes,* p. 44.

D. 7 | 13. A. —?

Six club-shaped processes stand erect on the top of the head, their summits flattish and scabrous; the smallest pair are situated between the nares. Fins streaked with bluish-black. (*Rich.*)

Mouth of Tree River, near the Coppermine, lat. 67° 12′ N.

20. Cottus hirundo.

Leiocottus hirundo, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 133, and *U. S. Pacif. R. R. Exped. Fishes,* p. 62. pl. 16. f. 2, 3.

B. 5. D. 9 | 17. A. 17. V. 1/3.

Posterior extremity of the maxillary with two or three small thread-like barbels. Skin perfectly smooth. Gill-openings continuous under the throat. Præoperculum with three spines, the upper of which is bifurcate, the points being bent upwards. Dark brown, irregularly spotted with black. (*Gir.*)

Island of San Miguel (California).

B. Species with antler-like processes at the præopercular spine, and with vomerine teeth.

21. **Cottus pistilliger.**

Pallas, Zoogr. iii. p 143. pl. 20. f. 3, 4; *Cuv. & Val.* iv. p. 193.

D. 9 | 13. A. 16.

Two spines above the snout. Crown with four obtuse and small tubercles; four præopercular spines, two of which are at the angle, the upper one very long and armed with two teeth. Lateral line with rough tubercles; a series of small filaments below the lateral line, each terminating in a small knob.

Coast of Kamtschatka (Port of Avatcha and Island of Unalashka).

22. **Cottus claviger.**

Cuv. & Val. iv. p. 195. pl. 79. f. 2 (bad); *Beech. Voy. Zool. Fishes*, p. 58. pl. 16. f. 1, 2.

D. 6 | 13. A. 11.

Two strong spines above the snout; the superciliary margins very elevated, with a deep groove between them. Four præopercular spines, the upper of which is exceedingly strong and long, extending nearly to the vertical from the extremity of the first dorsal, and denticulated on its upper margin. Occiput produced into two very long cuneiform processes. Lateral line with bony plates, each with a spiny keel; body covered with rough tubercles; a series of small cutaneous appendages above the anal.

Kamtschatka.

a. Type of the species. Kamtschatka. Presented by A. Collie, Esq.—The occipital processes have been taken off by a former examiner.

C. Species with antler-like processes at the præopercular spine, and without vomerine teeth.

23. **Cottus intermedius.**

Temm. & Schleg. Faun. Japon. Poiss. p. 38.

D. 9 | 13. A. 14.

No vomerine teeth. Two strong spines above the snout; a small tubercle above the upper posterior angle of the orbit; upper side of the head rough. Four præopercular spines, the upper one with four or five antler-like processes. Space between the eyes narrow and concave. Body and fins marbled with brown; pectoral and caudal fins with brown bands. (*Schleg.*)

Coast of Japan.

24. **Cottus ventralis.**

Cottus ventralis, *Cuv. & Val.* iv. p. 194. pl. 79. f. 1 (not good); *Beech. Voy. Zool. Fishes*, p. 58.
? Acanthocottus patris, *Storer, Bost. Journ.* vi. p. 250. pl. 7. f. 2.

D. 10 | 14. A. 16.

No vomerine teeth. Two spines above the snout; a small tubercle above the upper posterior angle of the orbit, none on the crown. Four præopercular spines, the upper as long as the diameter of the eye, with two antler-like processes. The upper side of the head with granulated tubercles; lateral line with a series of small elongate tubes. Pectoral and ventral very long, reaching beyond the origin of the anal.

Coast of Kamtschatka (and of Labrador).

a. Half-grown. Kamtschatka. Presented by A. Collie, Esq.—Type of the species.
b. Young.

25. **Cottus tricuspis.**

Cottus gobio, *Fabricius, Faun. Grœnl.* no. 115.
—— tricuspis, *Reinh. Vid. Selsk. Nat. Math. Afh.* v. p. lii.
Phobetor tricuspis, *Kröyer, Naturhist. Tidsskr.* i. 1844, p. 263.

D. 10 | 16. A. 18. Cæc. pylor. 6. Vert. $\frac{12}{23}$.

No vomerine teeth. Two very small spines above the snout; a small tubercle above the upper posterior angle of the orbit; on the crown none, or they are scarcely visible. Four præopercular spines, the upper as long as the diameter of the eye, with two antler-like processes, the anterior of which is very small. The space between the eyes concave; its width is much less than that of the diameter of the eye. Crown of the head and neck with groups of granulations; lateral line smooth. The pectoral fins reach beyond the origin of the anal, the ventrals to the vent. Dorsal and pectoral fins with brown spots, forming bands.

Coasts of Greenland.

a–g. Adult and young. Greenland.
h. Adult female: skeleton. Greenland.
i. Adult: Hudson's Bay. From the Haslar Collection.
k. Young. Hunde Island. Presented by Dr. Sutherland.
l. Young. Port Leopold. From the Haslar Collection.
m. Adult: stuffed.
n. Intestines of specimen *h*.

The liver is large, round, not divided into lobes, and situated principally on the left side of the stomach. The stomach is very spacious and curved; the pylorus with six appendages; the intestines appear to make one complete circumvolution. The ovaria are separated from each other to their posterior extremity. The urine-bladder is narrow, elongate, situated above the right-hand ovarium.

Skeleton.—The configuration of the skull is much more similar to *C. gobio* than to *C. scorpius* or *bubalis*. The space between the orbits is very slightly concave, very narrow, its width being nearly one-third the distance between the upper posterior angles of the orbits. The crown is flat, without any longitudinal or transverse ridges, but with a very slight impression in the middle. The frontal bones, the præoperculum, the mandibula, and the infraorbitals have very distinct muciferous channels; the turbinals are provided with a minute spine. The number of the caudal vertebræ is increased, there being twelve in the abdominal portion and twenty-eight in the caudal.

26. **Cottus diceraus.**

Cottus diceraus, *Pall. Nov. Act. Petrop.* 1783, p. 354. pl. 10. f. 7; *Cuv. & Val.* iv. p. 189; *Cuv. Règne Anim. Ill. Poiss.* pl. 21. f. 1; *Beech. Voy. Zool. Fishes*, p. 57. pl. 15. f. 2.
—— stelleri, *Bl. Schn.* p. 63.
Synanceia cervus, *Tiles. Mém. Acad. St. Pétersb.* iii. p. 278. pl. 13.
Ceratocottus* diceraus, *Gill, Proc. Acad. Nat. Sc. Philad.* 1859, p. 165.

D. 7 | 14–15. A. 10.

Two spines above the snout. The superciliary margin elevated and continued into a ridge, which terminates posteriorly in a trenchant point. Præoperculum with four spines, two of which are at the angle; the upper very long, equal to two-thirds the length of the head, and armed with eight recurved teeth; suboperculum with two spines. Lateral line with rough tubercles.

Coast of Kamtschatka.

33. CENTRIDERMICHTHYS.

Trachidermus†, *Heckel, Ann. Wien. Mus.* 1840, ii. p. 159.
Centridermichthys, *Richards. Voy. Sulph. Fishes*, p. 73.
Cottopsis, Oligocottus, et Leptocottus, *Girard in U. S. Pacif. R. R. Exped. Fishes*, p. 51, &c.

Head more or less depressed, rounded anteriorly; body subcylindrical, compressed posteriorly; head and body covered with soft and scaleless skin, more or less studded with prickles or granulations; lateral line present. Two dorsals, of moderate height; pectorals rounded, with some or all the rays simple; ventrals thoracic, of moderate length. *Teeth in the jaws, on the vomer and palatine bones.* Air-bladder none; pyloric appendages in moderate number.

Coasts of Japan and China; Pacific coasts of North America; fresh waters of California and of the Oregon and Washington Territories; coast of Greenland.

1. **Centridermichthys fasciatus.**

Trachidermus fasciatus, *Heckel, Ann. Wien. Mus.* ii. 1840, p. 160. taf. 9. f. 1, 2.
Centridermichthys ansatus, *Richards. Voy. Sulph. Fishes*, p. 74. pl. 54. f. 6–10.

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* Preoccupied by *Phobetor*.

† *Trachidermus* is inadmissible; the correct form, *Trachyderma*, was preoccupied long ago by Latreille for a genus of Insects.

Cottus uncinatus, *Temm. & Schleg. Faun. Japon. Poiss.* p. 38 (not *Reinh.*).

D. 8 | 19. A. 17.

Teeth on the vomer and the palatine bones. The space between the eyes is concave, and its width equals their diameter. Four præopercular spines, the upper of which is long, with the point curved upwards. Body covered with numerous minute granulations or prickles; a series of tubercles along the lateral line. Across the back four black bands, the last occupying the base of the caudal; a black spot at the base of the pectoral and the first dorsal; the rays of all the fins dotted with brown.

Coast of Japan; mouth of the Yangtsee-Kiang-Kew, in the north of China; Philippine Islands.

2. **Centridermichthys asper.**

Cottus asper, *Richards. Faun. Bor. Amer. Fishes*, pp. 295, 313. pl. 95. f. 1.
Trachidermus richardsoni, *Heckel, Ann. Wien. Mus.* 1840, ii. p. 162.
Centridermichthys asper, *Richards. Voy. Sulph. Fishes*, p. 74.
Cottopsis asper, *Girard, Proc. Bost. Soc. Nat. Hist.* iii. 1850, p. 303, and *Nouv. Mém. Soc. Helv. Sc. Nat.* xii. 1851, p. 185, and *U. S. Pacif. R. R. Exped. Fishes*, p. 51.

D. 9–10 | 21–22. A. 17. V. 1/4. Cæc. pylor. 5.

Gill-openings separated beneath by an isthmus. Three præopercular spines, the upper of which is the longest, covered by the skin, and with the point curved upwards. Crown with very small warts; back of the body with very minute spines. Yellowish-brown, with black spots and dots.

Fresh waters of the Oregon and Washington Territories.

3. **Centridermichthys gulosus.**

Cottopsis gulosus, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 129, and *U. S. Pacif. R. R. Exped. Fishes*, p. 35.

B. 6. D. 9 | 18. A. 14–15. V. 1/4.

Gill-openings separated beneath by an isthmus. Three præopercular spines, the upper of which is the largest, nearly entirely hidden by the skin, and with the point curved upwards. Skin smooth, except on a space immediately behind the pectorals, which is covered with very minute spines. The lateral line falls abruptly below the extremity of the soft dorsal. Reddish-brown, irregularly spotted with black; fins blackish-brown, caudal and pectorals variegated with black. (*Gir.*)

Fresh waters of California.

4. **Centridermichthys parvus.**

Cottopsis parvus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 144, and *U. S. Pacif. R. R. Exped. Fishes*, p. 54.

B. 6. D. 8 | 21. A. 15–17. V. 1/4.

Gill-openings separated beneath by an isthmus. Jaws equal. Præopercular spines very inconspicuous. Skin generally covered with very minute spines. The lateral line is slightly bent downwards on the tail. Olivaceous: body and fins spotted with black; a black blotch on the upper and posterior portion of the first dorsal. (*Gir.*)

Fresh waters of California.

5. Centridermichthys maculosus.

Oligocottus maculosus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 133, and *Journ. Bost. Soc. Nat. Hist.* 1857, pl. 24. f. 7, and *U. S. Pacif. R. R. Exped. Fishes*, p. 56.

B. 6. D. 8 | 16–17. A. 13–14. V. 1/3.

Gill-openings continuous under the throat. Head with the upper surface depressed and the snout very shelving. A stoutish bicuspid process on the convexity of the præoperculum. Yellowish-brown mottled with blackish; along the back a series of blotches of a deeper hue; the rays of the dorsal, caudal, and pectoral fins with black dots arranged in bands.

West coast of America from California to the Vancouver Islands.

a–f. Fine specimens. Vancouver Islands.—These specimens exhibit small tentacles on the upper part of the head and along the lateral line.

g, h. Adult.—The skin above the lateral line is granulated.

6. Centridermichthys analis.

Oligocottus analis, *Girard, Proc. Ac. Nat. Sc. Philad.* 1857, p. 201, and *U. S. Pacif. R. R. Exped. Fishes*, p. 57.

D. 9 | 17. A. 13. V. 1/3.

Gill-openings continuous under the throat. Head with the upper surface depressed and the snout very shelving. Præopercular spines moderate. Dorsal fins contiguous. Dorsal region with minute spines. Greenish-olive, spotted with black. (*Gir.*)

Coast of California.

7. Centridermichthys globiceps.

Oligocottus globiceps, *Girard in U. S. Pacif. R. R. Exped. Fishes*, p. 58.

D. 9 | 16. A. 12. V. 1/3.

Gill-openings continuous under the throat. Head with the upper surface convex and with the snout abruptly truncated, rounded. Præoperculum with rudimentary spines. Dorsal fins separated. Skin perfectly smooth. Reddish-brown, spotted with black. (*Gir.*)

Coast of California.

8. Centridermichthys armatus.

Leptocottus armatus, *Girard, Proc. Ac. Nat. Sc. Phil.* 1854, pp. 131, 145, and 1856, p. 133, and *in U. S. Pacif. R. R. Exp. Fish.* p. 60. pl. 15. f. 2.
Acanthocottus inermis, *Ayres.*

B. 6. D. 8 | 18. A. 17. V. 1/4.

Gill-openings separated beneath by an isthmus. The upper jaw longer than the lower; the upper maxillary reaches beyond the vertical from the centre of the orbit. A curved præopercular process provided with two spines directed upwards. Blackish-brown above; dorsal, caudal, and pectoral fins barred with black; anterior dorsal with a black spot posteriorly.

Pacific coast of the United States.

a–c. Fine specimens. New Orcas Islands (Gulf of Georgia). Presented by the Lords of the Admiralty.—Girard describes the upper maxillary as extending beyond the vertical from the posterior margin of the orbit. (?)

9. Centridermichthys bicornis.

Cottus bicornis, *Reinh. Vid. Selsk. Natur. og Math. Afh.* viii. p. lxxv.

B. 7. D. 8 | 15. A. 14.

Occiput with two acute points; four præopercular spines, the uppermost of which is bifurcate. (*Reinh.*)

Greenland.

10. Centridermichthys uncinatus.

Cottus uncinatus, *Reinh. Vid. Selsk. Natur. og Math. Afhandl.* 1833–34, p. xliv (not *Schleg.*).

Icelus uncinatus, *Kröyer, Naturhist. Tidsskr.* 1844, i. p. 253.

D. 8 | 13. A. 11.

Occiput with two rounded tubercles. Two præopercular spines, the upper of which is bent upwards, hooklike, with a smaller process at its base. (*Reinh.*)

Greenland.

34. ICELUS.

Icelus, *Kröyer, Naturhist. Tidsskr.* 1844, i. p. 253.

Head large, naked, armed at the opercles and on the neck; body subcompressed, with a dorsal series of bony plates from the neck to the base of the caudal; lateral line with osseous tubercles; on the sides and on the belly scattered scales. Two separate dorsals; ventrals thoracic, with less than five rays; no pectoral filaments. Villiform teeth in the jaws, on the vomer and the palatine bones Six branchiostegals. Air-bladder none.

Coasts of Spitzbergen and Greenland

1. Icelus hamatus.

Kröyer, l. c.

D. 9 | 20. A. 16. V. 1/3.

The length of the head is one-third of the total; the space between the orbits very narrow, one-fourth of the diameter of the eye; the upper jaw longest. Præoperculum with four spines, the upper three of which are hooked, and the uppermost bifurcate. Pectoral fins shorter than the head. Yellowish, with a great many brown spots. (*Kr.*)

Spitzbergen.

35. TRIGLOPS.

Triglops, *Reinh. Vid. Selsk. Natur. og Math. Afh.* v. p. lii; *Kröyer, Naturhist. Tidsskr.* 1844, i. p. 260.

Head of moderate size, subcompressed, naked, with the præoperculum armed; tail elongate, slender, subconical. Body with a series of bony plates along the dorsal fins, and with oblique and separate series of small and ciliated scales beneath the lateral line. Lateral line with osseous tubercles. Two separate dorsals; ventrals thoracic, with five soft rays; no pectoral filaments. Villiform teeth in the jaws and on the vomer, none on the palatine bones. Seven branchiostegals. Air-bladder none; pyloric appendages in moderate number.

Coast of Greenland (?).

1. Triglops pingelii.

Reinhardt & Kröyer, ll. cc.

D. 12 | 24. A. 24. V. 1/5.

The diameter of the eye is one-third the length of the head, longer than the snout, and three times the space between the orbits. Præoperculum with four spines, two at the posterior and two at the inferior margin. The length of the head is nearly one-fourth of the total. Brown above, with blackish spots; the pectoral with dark cross-bands. Male with a very large anal papilla.

36. HEMILEPIDOTUS.

Hemilepidotus, *Cuv. & Val.* iv. p. 275.

Head not depressed, naked; præoperculum armed; body with longitudinal bands of scales, alternating with naked stripes. One dorsal, divided by a notch into a spinous and soft portion; ventrals thoracic, and, like the pectorals, not enveloped in a thick membrane. No pectoral filaments. Villiform teeth in the jaws, on the vomer and the palatine bones. Six branchiostegals. Air-bladder none; pyloric appendages in small number.

Sea between N.E. Asia and N. America.

1. Hemilepidotus trachurus.

Cottus hemilepidotus, *Tiles. in Mém. Acad. St. Pétersb.* iii. p. 262. p. 11.
—— trachurus, *Pall. Zoogr. Ross.* iii. p. 138. pl. 25.
Hemilepidotus tilesii, *Cuv. & Val.* iv. p. 276. pl. 85; *Cuv. Règne Anim. Ill. Poiss.* pl. 22. f. 2.

D. $\frac{11}{18}$. A. $\frac{1}{14}$. Cæc. pylor. 5.

Head without skinny flaps. A band of rough scales, formed by four series, along the base of the dorsal fin, another broader one above and below the lateral line.

Coast of Kamtschatka; Kuriles.

2. Hemilepidotus spinosus.

Hemilepidotus spinosus, (*Ayres*) *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 134, and *U. S. Pacif. R. R. Exped. Fishes*, p. 68.

Calycilepidotus spinosus, *Ayres, Proc. Calif. Acad. Nat. Sc.* i. 1855, p. 76.

D. $\frac{11}{20}$. A. 16.

The upper surface and the sides of the head with skinny flaps. The dorsal band of scales composed of six rows anteriorly, a broader lateral band above and below the lateral line. Reddish-brown, with darker bands and blotches.

Coast of California.

37. ARTEDIUS.

Artedius, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 134.

Head rough, with skinny flaps above the orbits. Præoperculum armed. Body with a dorsal band of scales. Two separate dorsals, the second of which is the longer. Ventrals thoracic, not enveloped in a thick membrane. No pectoral filaments. Villiform teeth in the jaws, on the vomer and the palatine bones. Five branchiostegals.

Coast of California.

1. Artedius notospilotus.

Calycilepidotus lateralis, *Ayres, Proc. Calif. Acad. Nat. Sc.* 1855, p. 77.

Artedius notospilotus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 134, and *Bost. Journ. Nat. Hist.* 1857, pl. 24. f. 5, 6, and *U. S. Pacif. R. R. Exped. Fishes*, p. 71. pl. 22 *b*. f. 5, 6.

B. 5. D. 9 | 15. A. 10. V. 1/3.

The upper surface of the head tubercular and scaly. Præoperculum armed with a flat tricuspid spine. The dorsal band of scales broad, from the shoulder nearly to the end of the soft dorsal. Olivaceous, with four black bars across the back. (*Gir.*)

Coast of California.

2. Artedius lateralis.

Scorpænichthys lateralis, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 145.

Artedius lateralis, *Girard, l. c.* 1856, p. 134, and *U. S. Pacif. R. R. Exped. Fishes*, p. 70. pl. 22 *a*. f. 5, 6.

B. 5. D. 9 | 17. A. 11. V. 1/3.

The surface of the head smooth. Præoperculum armed with a flat bicuspid spine. The dorsal band of scales narrow, from the shoulder to the end of the second dorsal. Deep chestnut-brown, spotted with yellowish. (*Gir.*)

Coast of California.

38. PTYONOTUS*.

Triglopsis, *Girard, Cottoids of N. Amer. in Smithson. Contrib. Knowl.* iii. 1852, p. 64 (not *Kröyer*).

Head rather broad and depressed, rounded in front; body subcylindrical, compressed posteriorly; head and body with the skin soft and naked; lateral line present. Two dorsals: the second very elevated; pectorals rounded, with the rays simple; ventrals thoracic. Jaws and vomer with villiform teeth; none on the palatine bones. Air-bladder none; pyloric appendages in small number.

Lake Ontario.

1. Ptyonotus thompsonii.

Triglopsis thompsonii, *Girard, Proc. Bost. Soc. Nat. Hist.* iv. 1851, p. 19, and *Smiths. Contrib. l. c.* p. 65. pl. 2. f. 9, 10, pl. 3. f. 22–25, 36–38.

D. 7 | 18. A. 15. Cæc. pylor. 7.

Dorsal fins separated from each other. (*Gir.*)

Lake Ontario.

39. POLYCAULUS†.

Synanceia, sp., *Bl. Schn.* p. 194; *Cuv. & Val.* iv. p. 440.

Head broad, rather depressed, with the eyes directed upwards; body subcylindrical anteriorly, compressed posteriorly. Præoperculum armed. Scales none. *One dorsal with flexible spines and rays*; anal elongate; pectoral appendages none. Villiform teeth *in the jaws only*. Branchiostegals seven.

East Indian Seas.

1. Polycaulus elongatus.

? Synanceia uranoscopa, *Bl. Schn.* p. 195; *Cuv. & Val.* iv. p. 458.
Synanceia elongata, *Cuv. & Val.* iv. p. 456; *Bleeker, Verhand. Batav. Genootsch.* xxii. *Sclerop.* p. 10.
—— breviceps, *Richards. Voy. Sulph. Fishes,* p. 71.

D. 24–25. A. 15. Vert. 10/17.

Form of the head and position of the eye as in *Uranoscopus*. The upper surface of the head uneven; cheek without groove. No vomerine teeth. Brownish (in spirits), with whitish dots; pectoral and anal with a broad blackish margin.

East Indian Seas.

a. Adult. Java.
b, *c*. Adult. Madras. Presented by T. C. Jerdon, Esq.
d. Half-grown. Madras. Presented by T. C. Jerdon, Esq.
e. Half-grown. India. Presented by G. R. Waterhouse, Esq.
f. Adult. Sea of Pinang. From Dr. Cantor's Collection.
g, *h*. Adult: skins. Sea of Pinang. From Dr. Cantor's Collection.
i. Adult. China. Presented by J. R. Reeves, Esq.

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* From πτύον, a fan, and νῶτος, back.

† From πολύκαυλος, with many stems. (Anal with many rays.)

k. Adult female: skeleton. China.
l, *m*. Adult. China.

Skeleton.—The examination of the skeleton distinctly proves the necessity of removing this species from *Synanceia*. The maxillary is broad at the extremity, and provided with a longitudinal ridge; the descending branches of the intermaxillary are much longer than its posterior processes. The mandibula has a longitudinal ridge and several wide pores. The vomer is triangular, flat, with the anterior part very broad, gradually tapering posteriorly. The bones forming the bottom of the temporal and orbital grooves are firm, and joined together. The infraorbitals form a very solid bridge with a rough surface, and, together with the frontal, completely close the orbit. The anterior part of the bridge is armed with two spines inferiorly, and its posterior is broadly joined to the præopercular ridge, completely covering the temporal groove. The præoperculum has a strong ridge, from which others radiate, terminating in spines on the margin; the operculum with two ridges. There is a deep quadrangular groove between the orbits, in which the posterior processes of the intermaxillary are received. The crown is very broad and flat, with two parallel ridges and several lateral protuberances. The basal portion of the brain-capsule is flat and broad. The pubic bones form together a semi-elliptical disk, with a styliform process posteriorly. There are ten abdominal and seventeen caudal vertebræ. The neural, hæmal, interneural and interhæmal spines are of moderate strength and length.

40. PLATYCEPHALUS*.

Platycephalus, *Bl. Schn.* p. 58; *Cuv. & Val.* iv. p. 226.

Head broad, very depressed, more or less armed with spines; body depressed anteriorly, subcylindrical posteriorly, covered with ctenoid scales. Lateral line present. Two dorsals: the first spine isolated from the others. Ventrals thoracic, but rather remote from the root of the pectorals; no pectoral appendages. Jaws, vomer, and palatine bones with bands of villiform teeth. Air-bladder none; pyloric appendages in moderate number.

From Polynesia and the Australian Seas, through all the Indian Seas to the Eastern coasts of Africa.

* 1. Platycephalus borboniensis, *Cuv. & Val.* iv. p. 252.—Ile de France.
2. —— timoriensis, *Cuv. & Val.* iv. p. 254.—Timor.
3. —— longiceps, *Cuv. & Val.* iv. p. 255.—Red Sea.
4. —— vittatus, *Cuv. & Val.* ix. p. 462.—Malabar.
5. —— crocodilus, *Tiles. in Krusenst. Reise*, pl. 59. f. 2; *Cuv. & Val.* iv. p. 256.—Japan.
6. —— clavulatus, *Cant. Catal.* p. 38.—Pinang.—The skin of a young specimen from Dr. Cantor's Collection is in the British Museum, but Dr. Cantor himself was not certain of its proper determination, marking it as *Pl. clavulatus*, juv.?
7. —— fuscus, *Cuv. & Val.* iv. p. 241.—Pacific.
8. —— bassensis, *Cuv. & Val.* iv. p. 247; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 683. pl. 10. f. 3.—Port Western.
9. —— cultellatus, *Richards. Ichth. Chin.* p. 217.—China Sea.

A. *Species with two spines at the angle of the præoperculum.*

1. Platycephalus insidiator.

Cottus insidiator, *Forsk.* p. 25; *L. Gm.* i. p. 1213: *Shaw, Zool.* iv. p. 260.
Callionymus indicus, *L. Gm.* i. p. 1153.
Cottus spatula, *Bl.* taf. 424.
Platycephalus insidiator, *Bl. Schn.* p. 59; *Cuv. & Val.* iv. p. 227; *Rüpp. N. W. Fische,* p. 102; *Bleek. Verh. Bat. Gen.* xxii. *Sclerop.* p. 6; *Faun. Japon. Poiss.* p. 39. pl. 15. f. 1; *Cant. Catal.* p. 37.
—— spatula, *Bl. Schn.* p. 59.
Batrachus indicus, *Bl. Schn.* p. 43.
Calliomorus indicus, *Lacép.* ii. p. 343.
Cottus madagascariensis, *Lacép.* iii. p. 248. t. 11. f. 1, 2; *Shaw, l. c.* p. 261. pl. 37.
Russell, pl. 46.
Colliomorus chacca, *Buch. Ham.* pp. 133, 373.
Platycephalus endrachtensis, *Quoy & Gaim. Voy. Freyc. Zool.* p. 353; *Cuv. & Val.* iv. p. 240.
—— chacca, *Gray, Ind. Zool.* ii. pl. f. 2.

D. 1 | 6–7 | 13. A. 13. L. lat. ca. 120. Cæc. pylor. 8. Vert. 12/15.

The length of the head is $3\frac{3}{4}$ in the total, and its width between the præopercular spines $1\frac{1}{2}$ in its length; the distance between the eyes is one-half the length of the snout. The upper surface of the head is quite flat, the ridges being scarcely prominent. Two moderate præopercular spines, the upper rather shorter than the lower. The length of the second dorsal spine is less than one-half of that of the head. Lateral line smooth. The upper half of the caudal with two oblique black bands, the lower with one or two.

From the Red Sea to the coast of S. Africa, through all the Indian Seas to N.W. Australia.

a–c. Adult: stuffed. Ganges. Purchased of Mr. Warwick.
d. Adult: stuffed. Calcutta. From the Collection of the East India Company.
e. Adult. Japan.
f. Adult. China.
g, h. Half-grown. China. Presented by J. R. Reeves, Esq.
i. Half-grown: very bad state. China. Presented by the E. I. Company.
k. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
l. Half-grown. Ceylon. Purchased of Mr. Cuming.
m. Adult: skin. Malayan Peninsula. From Dr. Cantor's Collection.
n. Adult: stuffed. Moluccas. Purchased of Mr. Frank.
o. Half-grown. Amboyna. From Madame Ida Pfeiffer's Collection.
p. Adult: stuffed. Cape York. Voyage of the 'Rattlesnake.'
q. Adult. West Australia.
r. Half-grown: very bad state. N.W. Australia. From the Haslar Collection.
s. Adult: stuffed. Red Sea. From the Frankfort Museum.
t. Adult: stuffed. Port Natal.
u. Adult: skin. Cape of Good Hope. Purchased of Mr. Warwick.

v. Twenty-two inches long: stuffed. From the Collection of the Zoological Society.

w. Adult: skeleton. From the Haslar Collection.

x. Half-grown. Presented by the Zoological Society.

Skeleton.—If the skull of *Cottus gobio*, or of one of the allied species, were imagined to be more strongly depressed and more elongate, it would be that of a *Platycephalus.* In the present species, the bones of the upper surface of the skull, of the infraorbital ring, and of the opercular apparatus form one triangular plane, without any conspicuous ridges. The maxillary bone is of moderate extent, obliquely truncated posteriorly; the intermaxillary is much shorter, and has the posterior processes rather feeble; the descending branch widens behind. The mandibula is long, very low, nearly styliform, without any conspicuous muciferous channel. The vomer and the palatine bones are broad and flat; the former is rounded anteriorly. The turbinal bones are very thin, not armed. The infraorbital bones are oblong, and there is a smooth ridge from the centre of the præorbital to the angle of the præoperculum. The præorbital has several low ridges besides, radiating from a centre, and two or three terminating in small spines. The posterior infraorbital bone is broadly attached to the præoperculum; two small postorbital bones close the orbit posteriorly. The orbit itself is relatively small, its longest diameter equalling the width between the orbits. The præopercular limbs form together a somewhat acute angle, armed with two spines; each limb has a distinct muciferous channel. The operculum has two slight ridges, terminating in very small spines; the upper one is the strongest, visible externally and internally. The ethmoid forms part of the upper surface of the skull to between the orbits, the frontal bones being separated from each other. The space between the orbits is quite flat, as is the crown,—the longitudinal ridges which are seen in other species being scarcely visible. The basisphenoid is flat, rather broad, without ridges or grooves. The glossohyal is broad, triangular, with the top of the triangle obtuse and pointing backwards. The form of the urohyal corresponds with the general configuration of the head, the vertical ridge being very low.

The bones of the humeral arch, above the coracoid, are exceedingly short. The situation and the form of the pubic bones do not materially differ from the same bones in *Cottus* or *Trigla*[*]: in the three genera they are attached to the coracoid bones, and the fins are therefore truly thoracic, and not abdominal. In each pubic bone of the three genera, two axes can be distinguished, to which two stronger ridges correspond; the axes converge towards the insertion of the ventral rays:—1. A longitudinal axis, obliquely directed outwards: the anterior symphysis of the bones and the junction with the coracoid are situated at the anterior end of this axis. 2. A horizontal axis, horizontally or obliquely directed inwards: the posterior symphysis of the pubic bones is coincident with the interior extremities of this axis. The difference between the three genera is merely this: that whilst in *Cottus* the space between the axes is entirely, and in *Trigla* partially closed by a very thin bony plate, it remains open in *Platycephalus*.

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[*] A single glance at the skeleton of *Platycephalus* shows that Prof. Kaup, in calling the ventral fins of these fishes abdominal, has merely consulted their external appearance, and that the removal of *Platycephalus* from this family indicates rather a *petitio principii*, than the truth of his system.

There are twelve abdominal and fifteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·7. The single vertebræ are rather elongate; the anterior twelve have ribs. The hæmal, neural, &c. spines are feeble, strongly depressed.

The *teeth* are small, cardiform; the anterior portion of the intermaxillary is provided posteriorly with some stronger ones. The teeth of the vomer form a very narrow, uninterrupted, convex band; those of the palatine bones are in a single series.

2. **Platycephalus tasmanius.**

Richards. Trans. Zool. Soc. iii. p. 97, and *Voy. Ereb. & Terr. Fishes*, p. 23. pl. 18. f. 1, 2.

D. 1 | 7 | 14. A. 14. L. lat. ca. 115.

The length of the head is 3½ in the total, and its width between the præopercular spines 1½ in its length. The space between the eyes is slightly concave, and one-third the length of the snout. The upper surface of the head is flat, the ridges being scarcely prominent. Two præopercular spines of moderate size, the upper one considerably shorter than the lower. The length of the second dorsal spine is rather less than one-half of that of the head. Lateral line smooth. The posterior portion of the caudal black.

Coast of Van Diemen's Land; Port Jackson.

a. Adult. Van Diemen's Land. From the Haslar Collection.
b. Adult. Port Arthur. From the Haslar Collection.
c. (?) Half-grown. Madras. Presented by T. C. Jerdon, Esq., M.D.
d. Adult. From the Haslar Collection.
e. Adult. From the Haslar Collection.
f. Adult. From the Haslar Collection.
g. Adult. From the Haslar Collection.
—Types of the species.
h. Adult. Presented by J. B. Jukes, Esq.

3. **Platycephalus lævigatus.**

Cuv. & Val. iv. p. 248; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 684. pl. 10. f. 4.

D. 1 | 8 | 14. A. 14.

Head with the ridges scarcely visible, and without any spines; the upper præopercular spine is twice as long as the lower. The space between the eyes is one-half only of their vertical diameter. Brown above, white below; anal white, the rays of the other fins spotted with brown.

Port Western.

4. Platycephalus inops.

Jenyns, Zool. of the Beagle, Fishes, p. 33.

D. 1 | 7 | 12. A. 12.

The length of the head is nearly twice its own breadth, and nearly one-third of the total. Head without spines, presenting the usual ridges, which, however, are not very salient; the præopercular spines are very short and inconspicuous, of equal length, the lower one ounded off almost to nothing. Lateral line perfectly smooth. Above uniform deep brown, beneath white, the two colours separated by a well-defined line. First dorsal with a very large deep-brown blotch; the second dorsal, caudal, and pectoral spotted, the anal and ventral uniform blackish-brown. (*Jen.*)

King George's Sound (New Holland).

5. Platycephalus grandispinis.

Cuv. & Val. iv. p. 242.

D. 1 | 7 | 15. A. 14.

The lower præopercular spine four times stronger and longer than the upper one, reaching nearly to the margin of the operculum. Præorbital with three small spines, the anterior of which is the largest. Lateral line and crown of the head smooth. Fins spotted with brown. (*Cuv.*)

East Indies?

6. Platycephalus punctatus.

Cuv. & Val. iv. p. 243; *Bleeker, Sclerop.* p. 25; *Quoy. & Gaim. Voy. Astrol. Poiss.* p. 682 [? pl. 10. f. 2: cfr. Platycephalus quoyi].

D. 1 | 8 | 11. A. 11. L. lat. 80–90.

The length of the head is $3\frac{1}{4}$ in the total, its breadth about one-half its length. The width between the eyes is one-third of the length of the snout. The upper præopercular spine much longer than the lower; spines on the crown of the head and the orbit; a pair of turbinal spines. Lateral line smooth. Greyish-brown, with five brown cross-bands; head and body with scattered black dots; the first dorsal yellow, above and behind black; the rays of the second dorsal dotted with brown; pectorals variegated with brown; anal yellow; caudal with large, irregular black spots.

Coast of Trincomalee; Sea of Batavia; Vanicolo Islands.

7. Platycephalus quoyi.

? Platycephalus punctatus, *Quoy & Gaim. Voy. Astrol. Poiss.* pl. 10. f. 2 [not descr.: cfr. Platycephalus punctatus].

Platycephalus quoyi, *Bleek. Ternate,* viii. p. 206.

D. 1 | 8 | 11. A. 11. L. lat. 110.

The length of the head is $3\frac{3}{5}$ to $3\frac{3}{4}$ in the total, its breadth $1\frac{3}{4}$ in its length. The width between the eyes is about one-third of the length of the snout. Orbit without filament; nostril with a cirrus, much shorter than the eye. The upper præopercular spine more than twice as long as the lower. Spines on the crown of the head and on the orbit; a pair of turbinal spines; operculum with two ridges, not serrated. Lateral line smooth. Rose-coloured, marbled with brownish and dotted with black; dorsal spines and rays spotted with brown, the first dorsal with an oblique black band; pectoral, ventral, and caudal fins with brownish spots, arranged in transverse bands; the lower half of the anal whitish. (*Bl.*)

Seas of Ternate and Amboyna.

8. **Platycephalus malabaricus.**

Platycephalus malabaricus, *Cuv. & Val.* iv. p. 245.
—— carbunculus, *Cuv. & Val.* ix. p. 461; *Cant. Catal.* p. 39.

D. 1 | 8 | 12. A. 12. L. lat. 75.

The length of the head is $3\frac{1}{4}$ in the total, and its width between the præopercular spines $1\frac{4}{5}$ in its length; the distance between the eyes is one-fourth of the length of the snout, and concave. The superciliary ridge, a ridge between the præorbital and the angle of the præoperculum, and a third between the orbit and the scapula are armed with small spines directed backwards. Two præopercular spines, the upper of which is long, the lower short. No tentacle above the orbit. The length of the third dorsal spine is less than one-half of that of the head. Lateral line smooth. Body and fins uniform brownish-grey, or irregularly spotted with brown.

East Indian Seas.

a. Half-grown. Moluccas. Purchased of Mr. Frank.
b, c. Half-grown: skins. Malayan Peninsula. From Dr. Cantor's Collection.—Types of *Pl. carbunculus*.

9. **Platycephalus japonicus.**

Tiles. in Krusenst. Reise, tab. 59. f. 1; *Cuv. & Val.* iv. p. 256; *Faun. Japon. Poiss.* p. 40. pl. 16. f. 3; *Bleeker, Verhand. Batav. Genootsch.* xxv. p. 28.

D. 1 | 7 | 12. A. 12. L. lat. ca. 100. Vert. 12/15.

The length of the head is $3\frac{1}{5}$ in the total, and its width between the præopercular spines $1\frac{4}{5}$ in its length; the distance between the eyes is one-fifth of the length of the snout, and concave. A series of spines along the superciliary margin, a second from the eye to the scapular and a third, of two spines, on the infraorbit ring; there are a pair of turbinal and a pair of occipital spines besides. Two præopercular spines, of rather small size, the upper being considerably larger than the lower. The length of the third dorsal spine is $2\frac{1}{3}$ in that of the head. Lateral line smooth. A tongue-shaped membranaceous flap below the præopercular spines. Reddish-olive, dotted with brown; six brown bars across the back; the first dorsal with a broad oblique blackish band; the other fins spotted with brown.

Chinese and Japanese Seas.

a. Adult. China. From the Haslar Collection.
b. Adult: stuffed. China. From the Zoological Society's Collection.
c–f. Half-grown. China.
g. Half-grown. China.
h. Half-grown. China.
i. Half-grown. China. Presented by Capt. Sir E. Belcher.
k. Half-grown. Japan.
l. Adult.
m. Adult: skeleton. Purchased.

Skeleton.—The skull appears less flat and broad than in *Pl. insidiator*, the infraorbital ring and the opercles being situated below the level of the upper surface of the skull. The maxillary is rather feeble, and excavated in its posterior half; the intermaxillary is much shorter, very broad posteriorly. The mandibula and the palatines are similar to those in *Pl. insidiator*. The vomer is of moderate width, with two parallel, longitudinal, toothed prominences. The infraorbital bones are oblong and narrow, and there is a ridge, extending from the centre of the præorbital to the angle of the præoperculum; the spinous teeth on this ridge correspond to each of the infraorbital bones. The præorbital has several low ridges besides, radiating from a centre, and not terminating in spines. Two small postorbital bones close the orbit posteriorly. The orbit itself is large, its longitudinal diameter being three times the interorbital space. The præopercular limbs form together an acute angle, armed with two spines; the limbs have a distinct muciferous channel. There are three slight ridges on the operculum, terminating in very small spines; the middle one is the strongest. The ethmoid forms part of the upper surface of the skull, separating the frontals from each other. The præfrontals are armed with an erect spine. The space between the orbits is rather narrow and concave; the orbital margin of the frontals elevated, and serrated posteriorly. There are two parallel ridges on each side of the crown, the inner pair with three spines, the outer one with four. The free space between the two processes of the suprascapula, by which the bone is fixed to the skull, forms, in this species, the ovate opening of a short canal, leading obliquely backwards to the posterior side of the skull; this opening is situated entirely on the upper surface of the skull. The occipital crest is not raised above the level of the skull, and has a deep pit on each side. The structure of the other bones corresponds well with *Pl. insidiator*, except the glossohyal, which is subquadrangular and exceedingly broad, especially anteriorly.

There are twelve abdominal and fifteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·5. The structure of the single bones does not differ from *Pl. insidiator*.

The villiform band of intermaxillary *teeth* is much broader than that of the mandibula. The vomerine teeth are in two separate oblong groups, with a groove between; the palatine teeth form a very narrow band.

10. Platycephalus guttatus.

Temm. & Schleg. Faun. Japon. Poiss. p. 39. pl. 15. f. 2.

D. 9 | 12. A. 12.

Ridges of the head spinous. Brownish-grey, dotted with black; back with eight blackish cross-bands. All the fins with dark spots, arranged in series.

A doubtful species from the coast of Japan.

11. Platycephalus isacanthus.

Cuv. & Val. iv. p. 246; *Cuv. Règne Anim. Ill. Poiss.* pl. 22. f. 3 (not good); *Less. Voy. Coq. Zool. Poiss.* p. 214.

D. 1 | 8 | 12. A. 12.

The first dorsal spine rather long and slender; the præopercular spines short and nearly equal; spines on the crown of the head and the orbit; a pair of turbinal spines; lateral line smooth; no tentacle above the orbit. Brown, with obsolete cross-bands; all the fins dotted with brown. (*Cuv.*)

Seas of Waigiou and Buru.

12. Platycephalus serratus.

Cuv. & Val. iv. p. 259.

D. 1 | 8 | 12. A. 11.

The length of the head is one-fourth of the total; the width of the groove between the eyes is one-fourth of their diameter. The ridges on the upper surface of the head and on the infraorbital ring are serrated, that of the operculum is smooth. Two præopercular spines, the upper of which is the longer. Lateral line smooth. Reddish-brown, with cross-bands; fins with blackish spots; dorsal with a blackish blotch; ventrals above blackish. (*Cuv.*)

Coast of Trincomalee.

13. Platycephalus polyodon.

Bleeker, Batavia, p. 462.

D. 1 | 8 | 11. A. 11. L. lat. 60.

The length of the head is one-third of the total, and its breadth one-half of its length. The width of the space between the orbits is nearly one-fourth of their diameter. The vertex, the orbit above, the temple, and the infraorbital with serrated ridges; operculum without serrated ridge; præoperculum with two spines, the upper of which is much the longer; interoperculum with two spines, the anterior pointing forwards. Lateral line smooth. Greenish rose-coloured; head irregularly spotted with brown; body with five or six cross-bands. The membrane of the spinous dorsal brown; the rays of the soft dorsal spotted with brown; the inferior part of the anal violet, yellow-edged; the lower half of the pectoral brown; ventral brown, yellow-edged; the caudal with a brown cross-band on the base and on the posterior half. (*Bl.*)

Sea of Batavia.

14. **Platycephalus malayanus.**

Bleeker, Sumatra, iii. p. 498.

D. 1 | 8 | 11. A. 12. L. lat. 60.

The length of the head is $3\frac{3}{4}$ in the total, and its breadth is $1\frac{2}{5}$ in its length. The width of the space between the orbits is about one-half of their diameter. Spines on the upper surface of the head; superciliary ridge denticulated; infraorbital ring with three spines; præoperculum with two spines, the upper of which is much the longer. Nostrils tentaculated. Lateral line smooth. Rose-coloured, with three cross-bands, the anterior of which is the broadest, the posterior the narrowest; head and back with round lighter dots, which are brown-edged on the head; the rays of all the fins, except of the anal, variegated with whitish and brownish. (*Bl.*)

Sea of Padang.

15. **Platycephalus tentaculatus.**

?? Platycephalus longiceps, *Cuv. & Val.* iv. p. 255.
Platycephalus tentaculatus, *Rüpp. N. W. Fische,* p. 104. taf. 26. f. 2.

D. 1 | 7 | 11. A. 11. Cæc. pylor. 7. Vert. 11/16.

The length of the head is one-third of the total. The ridges of the head denticulated. Membranaceous tentacles above the nostril, above the eye, and below the præopercular spines. Præopercular spines moderate; the upper one is the stronger. Lateral line smooth. Above uniform greenish; all the fins greenish-white, spotted with darker. (*Rüpp.*)

Red Sea.

16. **Platycephalus nematophthalmus.**

D. 1 | 8 | 11. A. 11. L. lat. 105.

The length of the head is $3\frac{1}{2}$ in the total; the ridges of the head with some small spines. A tentacle of moderate length above the orbit, a single flat one below the angle of the præoperculum, none at the nostril. Præopercular spines rather short, and of nearly equal size. Lateral line smooth. Brownish (in a preserved state).

with seven darker cross-bands on the back; fins spotted with brownish; the spines and rays of the dorsal and caudal fins crossed by fine black lines.

Australian Seas.

a. Adult. Port Essington. From the Haslar Collection.
b. Adult: stuffed. Victoria. Voyage of H.M.S. Herald.

Description.—The length of the head is 3½ in the total, or three times in the length without the caudal; its width between the præopercular spines is one-half of its length. The snout, as usual, is broad and depressed, with the lower jaw longest; it comprises one-third of the length of the head. The upper maxillary reaches to below the anterior third of the eye. The diameter of the eyes is one-sixth of the length of the head; their soft integuments are provided with a band-like tentacle, of about the same length as the diameter. The space between them is concave and narrow, its width being not one-half the diameter of the eye. There is a deep groove behind the upper posterior angle of the orbit. The spines of the head are arranged as follows:—A pair of turbinal spines, a pair above the anterior margin of the orbit, two or three pairs of very obtuse ones between the grooves mentioned, and one pair on the occiput; each ridge between the orbit and the commencement of the lateral line is armed with four or five very obtuse spines, and the infraorbital ridge with a single spine only, below the posterior margin of the orbit. The præopercular spines are rather short, the upper one being slightly the longest. The two opercular spines are distinct; there is a short broad flap at the extremity of the suboperculum, below the angle of the præoperculum.

The first *dorsal* begins with a short and isolated spine vertically between the roots of the ventral and the pectoral fins; the length of this spine is about one-fifth of the following, which is rather shorter than the third, the length of which is contained 2½ times in that of the head. The second dorsal is entirely separated from the spinous, and somewhat lower, the rays being of nearly equal length. The *caudal* has the posterior margin rounded, and is one-half the length of the head. The *anal* is lower than the opposite fin. The *pectoral* is rather short, reaching to the vertical from the interspace between the fifth and sixth dorsal spines; the lower eight rays are simple. The *ventral*, longer than the pectoral, reaches to the origin of the anal.

All the *teeth* form villiform bands; those of the vomer are arranged in two separate longitudinal bands, parallel to those of the palatine bones.

The two specimens of this fish have now a brownish ground-colour on the upper parts; among other more irregular spots, seven blackish bands across the back are distinctly visible, three corresponding to the first dorsal, three to the second, and one situated across the root of the caudal; the latter is the darkest. All the fins are spotted and variegated with brown, and the spines and rays of the dorsal and caudal fins are crossed by fine black streaks.

	inches.	lines.
Total length	8	10
Length of the head	2	6
Distance between the angles of the præopercles	1	2
Length of the snout	0	$10\frac{1}{2}$
Diameter of the eye	0	5
Distance between the eyes	0	$2\frac{1}{3}$
Length of the third dorsal spine	1	0
——— of a dorsal ray	0	$10\frac{1}{2}$
——— of an anal ray	0	8
——— of the pectoral	1	0
——— of the ventral	1	6

17. Platycephalus cirronasus.

Richards. Voy. Ereb. & Terr. Fishes, Ichthyol. p. 114. pl. 51. f. 7–10.

D. 1 | 8 | 12. A. 11. L. lat. 60.

Each nostril with a cirrus of moderate length. The length of the head is one-third of the total, and its width between the præopercular spines $1\frac{5}{6}$ in its length. The space between the eyes is very concave, and $4\frac{1}{2}$ in the length of the snout. Prominent spines on the upper side of the head, but none on the infraorbital ring. Two small spines at the angle of the præoperculum. Lateral line smooth. Rose-coloured, with some violet spots along the base of the dorsal, and some darker bars across the back of the tail. Fins dotted with rose-colour.

Botany Bay.

a. Adult. Botany Bay. Presented by Sir J. Richardson.—Type of the species.

18. Platycephalus tuberculatus.

Cuv. & Val. iv. p. 258.

D. 1 | 7 | 11. A. 11. L. lat. 53.

The length of the head is $3\frac{1}{2}$ in the total, and its width between the præopercular spines $1\frac{3}{5}$ in its length. The space between the eyes is a narrow deep groove, the width of which is $4\frac{1}{2}$ in the length of the snout. The superciliary, occipital, opercular, scapulary, and infraorbital ridges are finely serrated, the latter being very prominent. Two præopercular spines, the upper of which is the longer, but much shorter than its distance from the orbit. Anterior half of the lateral line spiny. Brownish, with clouded bands; rays of the fins spotted.

Seas of Trincomalee and Madras.

a–d. Adult and half-grown. Madras. Presented by T. C. Jerdon, Esq.

19. Platycephalus scaber.

Cottus scaber, *L. Mus. Ad. Fred.* ii. p. 66, and *Syst. Nat.* i. p. 451; *Bl.* taf. 180.
Russell, pl. 47.
Platycephalus scaber, *Bl. Schn.* p. 58 (part.); *Bleek. Verhand. Batav. Genootsch.* xxii. *Sclerop.* p. 6 (not *Cuv.*).
? Platycephalus rodericensis, *Cuv. & Val.* iv. p. 253.
Platycephalus rodericensis, *Trosch. Wiegm. Arch.* 1840, p. 270.

D. 1 | 8 | 12. A. 12.

The length of the head is $3\frac{3}{5}$ in the total, and its width between the præopercular spines $1\frac{3}{5}$ in its length; the space between the eyes is very concave, and half as wide as the vertical diameter of the orbit. The superciliary ridge, a ridge from the eye to the occiput, another from the eye to the scapula, and a fourth from the præorbital to the angle of the præoperculum, armed with spines directed backwards. Two præopercular spines, the upper of which is very long, and would reach into the orbit if laid forwards. The length of the second dorsal spine is $2\frac{1}{3}$ in that of the head. The anterior portion of the lateral line spiny.

Indian Ocean.

20. Platycephalus neglectus.

Troschel in Wiegm. Arch. 1840, p. 272.

D. 1 | 7 | 12. A. 12. L. lat. ca. 105.

The length of the head is $3\frac{3}{4}$ in the total, and its width between the præopercular spines $1\frac{4}{5}$ in its length; the space between the eyes is concave, and $2\frac{1}{2}$ in the length of the snout, or two-thirds of the vertical diameter of the eye. The superciliary ridge, a ridge from the eye to the occiput, another from the eye to the scapula, and a fourth from the præorbital to the angle of the præoperculum, armed with small spines directed backwards. Two præopercular spines, the upper of which is equal in length to one-half its distance from the orbit; the lower short. The length of the second dorsal spine is $2\frac{1}{2}$ in that of the head. Lateral line spiny, with about fifty-five spines. The first dorsal blackish, the other vertical fins spotted with brown.

East Indian Seas.

a–c. Half-grown and young. Madras. Presented by T. C. Jerdon, Esq.
d. Half-grown. Madras. Presented by T. C. Jerdon, Esq.
e. Half-grown. China. Presented by General Hardwicke.
f, g. Half-grown. China.
h. Half-grown. China. From Dr. Cantor's Collection.
i. Young. China. From Dr. Cantor's Collection.
k. Adult: stuffed. From the Collection of the Zoological Society.

21. Platycephalus suppositus.

Platycephalus scaber, *Cuv. & Val.* iv. p. 249 (not *Bl. Schn.*).
—— suppositus, *Trosch. Wiegm. Arch.* 1840, p. 269.

D. 1 | 8 | 12. A. 13.

The length of the head is $3\frac{1}{5}$ in the total, and its width between the præopercular spines 1⅙ in its length; the interorbital space is very slightly concave, and its width nearly equals the vertical diameter of the eye. The superciliary ridge, a ridge from the eye to the occiput, another from the eye to the scapula, and a fourth from the præorbital to the angle of the præoperculum, armed with small spines directed backwards. The length of the upper præopercular spine equals its distance from the orbit. The length of the second dorsal spine is 2⅚ in that of the head. Lateral line armed with forty-four spines.

Indian Ocean.

B. *Species with more than two spines at the angle of the præoperculum.*

22. Platycephalus bataviensis.

Bleeker, Batavia, p. 460.

D. 1 | 8 | 12. A. 12. L. lat. 60.

The length of the head is 3⅓ in the total, and its breadth one-half of its length; the width of the space between the eyes is one-third of their diameter. Spines on the upper side of the head; superciliary ridge denticulated; infraorbital ridge with two spines; præoperculum with three spines, the upper of which is the longest. Lateral line smooth. The ventral fins reach to the anal. Above uniform brownish green; the rays of all the fins, except of the anal, variegated with brown; the membrane of the caudal spotted with brown. (*Bl.*)

Sea of Batavia.

23. Platycephalus pristis.

Peters in Wiegm. Arch. 1855, p. 240.

D. 1 | 7 | 13. A. 14. L. lat. 51.

The space between the eyes is concave, and one-fourth of their diameter. Crown of the head with several series of spines; another series between the præorbital and the præoperculum; a pair of turbinal spines. Three præopercular spines, the upper of which is the longest. Lateral line smooth. The two dorsals rather remote from each other. Yellowish brown, marbled with darker on the head and on the sides; all the fins with spots, arranged in bands. (*Pet.*)

Coast of Mozambique.

24. Platycephalus macrolepis.

Bleeker, Japan, p. 399, and *Verh. Bat. Gen.* xxvi. *Japan*, tab. 4. f. 1.

D. 1 | 8 | 11. A. 12. L. lat. 40.

The length of the head is 3⅔ in the total, and its breadth 1⅓ in its length; the width of the space between the eyes is one-third of their diameter; orbit without filament. Spines above the snout and on the crown of the head; supraorbital and infraorbital ridges denticulated, opercular ridges entire; three præopercular spines, the upper of which is the longest. Lateral line smooth. The ventral fins reach nearly to the anal. Greenish, with five brownish cross-bars; the first dorsal brownish, the anal white, the rays of the other fins dotted. (*Bl.*)

Sea of Japan.

25. **Platycephalus bobossok.**

Bleeker, Batav. p. 461.

D. 1 | 8 | 11. A. 12. L. lat. 70.

The length of the head is $3\frac{2}{5}$ in the total, and its breadth is $1\frac{3}{4}$ in its length; the width of the space between the eyes is one-fourth of their diameter. Spines on the upper side of the head; supraorbital ridge denticulated; infraorbital ridge with five or six spines; præoperculum with three spines, the middle of which is the longest. Lateral line armed with exceedingly small spines. The ventral fins reach to the anal. Greenish-brown, with about four darker cross-bands; the spinous dorsal marbled with brown, the rays of the other fins variegated with brown. (*Bl.*)

Sea of Batavia.

26. **Platycephalus pristiger.**

Cuv. & Val. iv. p. 260; *Quoy & Gaim. Voy. Astrol. Poiss.* iii. p. 685. pl. 10. f. 5; *Bleek. Ternate,* viii. p. 205.

D. 1 | 8 | 11. A. 11. L. lat. 55.

The length of the head is $3\frac{1}{3}$ to $3\frac{2}{5}$ in the total, and its breadth $1\frac{2}{3}$ to $1\frac{3}{4}$ in its length; the width of the space between the eyes is one-fourth of their diameter; orbit without filament. Numerous spines and denticulations on the upper surface of the head and on the sides; four or five præopercular spines, the upper of which is the longest; interoperculum anteriorly with a long spine. Lateral line nearly entirely smooth. The ventral fins reach to the anal. Rose-coloured, clouded with brownish; anal white, the rays of the other fins dotted with brownish; the tips of the first dorsal and of the ventral fins, and the posterior part of the caudal brownish.

Seas of New Guinea, Celebes, Ternate, and Java.

27. **Platycephalus celebicus.**

Bleeker, Celebes, vi. p. 450.

D. 1 | 7 | 12. A. 13. L. lat. 53.

The length of the head is $3\frac{3}{5}$ in the total, and its breadth is $1\frac{2}{5}$ in its length; the width of the space between the eyes is one-third of their diameter; orbit without filament. Spines on the upper side of the head, many denticulations on the supra- and infraorbital ridges; four præopercular spines, the second of which is the longest; interoperculum without spine. Lateral line nearly entirely smooth. The ventral fins reach to the anal. Olive, marbled with brown: cheeks orange-coloured, with broad brown bands; the first dorsal with a broad oblique blackish band, the rays of the other fins dotted with brown. (*Bl.*)

Sea of Manado (Celebes).

28. **Platycephalus asper.**

Cuv. & Val. iv. p. 257. pl. 82; *Faun. Japon. Poiss.* p. 40. pl. 16. f. 4, 5.

D. 1 | 8 | 11. A. 11. L. lat. 50.

The length of the head is one-third of the total, and its width between the præopercular spines one-half of its length. The space between the eyes is an exceedingly narrow groove. The superciliary, occipital, scapulary, and infraorbital ridges are finely serrated, but that of the operculum is smooth. Three præopercular spines, the upper of which is the longest; a fourth, strong one pointing forwards. Lateral line nearly smooth. Yellowish-brown, with brown dots on the fins.

Seas of Japan and China.

a. Half-grown. China. Presented by Capt. Sir E. Belcher.
b. Young. China. Presented by Capt. Sir E. Belcher.

29. **Platycephalus spinosus.**

Temm. & Schleg. Faun. Japon. Poiss. p. 40. pl. 16. f. 1, 2 (not good); *Bleek. Verh. Bat. Gen.* xxvi. *Japan*, p. 77.

D. 1 | 8 | 12. A. 12. L. lat. 34–35 (40).

The length of the head is $3\frac{1}{5}$ in the total, and its width $1\frac{2}{5}$ in its length; the width of the space between the eyes is one-third of their diameter; orbit without filament. Crown of the head with many spines; the ridge between the præorbital and præoperculum denticulated. Three præopercular spines, the upper of which is the longest; the anterior portion of the lateral line spiny. The ventral fins reach to the anal. Brownish-red, with four brown cross-bars; the ventrals with blackish tips, anal white, the other fins dotted.

Sea of Japan.

41. HOPLICHTHYS.

Oplichthys, *Cuv. & Val.* iv. p. 266.

Head broad, very depressed, with the snout produced and rounded anteriorly, strongly armed, and with the upper surface and sides bony; back and sides of the body covered with bony plates. Two dorsals, the first much shorter than the second. No pectoral filaments. Ventrals inserted a little before the pectorals. Minute teeth in the jaws, on the vomer and the palatine bones. Air-bladder none; pseudobranchiæ.

Sea of Japan.

1. Hoplichthys langsdorffii.

Cuv. & Val. iv. p. 264. pl. 81; *Temm. & Schleg. Faun. Japon. Poiss.* p. 156. pl. 79. f. 2.

D. 6 | 15. A. 16.

Along the side of the body a series of large bony plates, each armed with two spines.

Japanese and Chinese Seas.

a. Adult. Japan. Purchased of Mr. Frank.
b. Adult.
c. Half-grown. From the Haslar Collection.
d, *e*. Adult. China. From the Haslar Collection.
f–r. Dried specimens.

42. BEMBRAS.

Bembras, *Cuv. & Val.* iv. p. 282.

Head not very depressed, armed and scaly on the sides; body covered with rather small scales. Two dorsals, of nearly equal development, the first with nine or eleven spines. Ventrals thoracic, but inserted a little before the pectorals, with five soft rays and one spine. No pectoral appendages. Villiform teeth in the jaws, on the vomer and the palatine bones. Seven branchiostegals. Air-bladder none.

Sea of Japan.

1. Bembras japonicus.

Bembras japonicus, *Cuv. & Val.* iv. p. 282. pl. 83; *Faun. Japon. Poiss.* p. 41. pl. 16. f. 8.

B. 7. D. 11 | 12. A. 14. L. lat. 55.

Infraorbital ridge with four denticulations, directed backwards. Red; dorsal fins with greenish spots.

Sea of Japan..

a, *b*. Adult: stuffed. Japan.

2. Bembras curtus.

Temm. & Schleg. Faun. Japon. Poiss. p. 42. pl. 16. f. 6, 7.

B. 7. D. 9 | 9. A. 8.

The infraorbital ridge with three denticulations. Uniform reddish (in a dried state).

Sea of Japan.

43. PRIONOTUS.

Prionotus, (*Lacép.*) *Cuv. & Val.* iv. p. 85.

Head parallelopiped, with the upper surface and the sides entirely bony. Scales small, or of moderate size. Two dorsals, the first much shorter than the second. Three pectoral filaments. Villiform teeth in both the jaws, on the vomer and the palatine bones. Air-bladder generally with lateral muscles, and divided into two lateral parts. Pyloric appendages in moderate number.

Coasts of the New World; one species from Japan.

1. **Prionotus lineatus.**

Trigla lineata, *Mitchill, Trans. Lit. & Phil. Soc. New York*, i. p. 430. pl. 4. f. 3.
Prionotus strigatus, *Cuv. & Val.* iv. p. 86; *Cuv. Règne Anim. Ill. Poiss.* pl. 20. f. 2 (not good).
—— lineatus, *Dekay, New York Fauna, Fishes*, p. 45. pl. 4. f. 12.

D. 8–9 | 13. A. 13. Vert. 10/15.

Præorbital obtuse in front, granulated; no spines on the side of the head or above the upper posterior angle of the orbit. The palatine teeth form a very narrow band. The pectoral appendages tapering. Brown above, dotted with darker; pectoral brownish-grey, with many narrow darker cross-streaks, on the inner side blackish, with a broad white upper margin. The first dorsal with a black spot between the fourth and sixth spines; the second greyish, with brownish points on the rays.

Atlantic coasts of North America.

a. Half-grown.
b. Adult.

2. **Prionotus carolinus.**

Trigla carolina, *L. Mantissa*, p. 528.
—— palmipes, *Mitchill, Trans. Lit. & Phil. Soc. New York*, i. p. 431. pl. 4. f. 5.
Prionotus pilatus, *Storer, Proc. Bost. Soc. Nat. Hist.* ii. p. 77, and *Report Fish. Massach.* p. 20. pl. 6. f. 1; *Baird, Ninth Smiths. Report*, p. 327.
—— carolinus, *Cuv. & Val.* iv. p. 90; *Storer, Report*, p. 14; *Dekay, New York Fauna, Fishes*, p. 46. pl. 5. f. 15.

D. 10 | 13. A. 12. L. lat. 100. Vert. 10/16.

Præorbital obtuse and swollen in front, coarsely granulated, without spines on the side; a small spine above the posterior upper angle of the orbit, with a groove behind, joining that of the other side. The palatine band four times as long as broad. The pectoral appendages dilated at their extremity; the pectoral fin extends to the vertical from the fourth anal ray. Brown, clouded with darker; the first dorsal with a black spot, the second with oblique whitish streaks.

Atlantic coasts of the United States.

a. Adult. New York. Purchased of Mr. Brandt.

3. Prionotus punctatus.

Parra, lam. 38; *Browne*, *Jamaica*, pl. 47.
Trigla carolina, *Bloch*, tab. 352; *Bl. Schn.* p. 13.
—— punctata, *Bloch*, tab. 353; *Bl. Schn.* p. 13.
Prionotus punctatus, *Cuv. & Val.* iv. p. 93; *Jenyns*, *Zool. Beagle*, *Fishes*, p. 28; *Casteln. Anim. nouv. ou rares Amér. Sud*, p. 7.

D. 10 | 12. A. 11. L. lat. 80. Caec. pylor. 6. Vert. 11/15.

The length of the head is $3\frac{1}{2}$ in the total; the space between the eyes is narrow and deeply concave, its width being less than that of the eye. The praeorbital does not project beyond the snout. Several small spines between the praeorbital and the praeopercular spine. Pectoral appendages tapering; the pectoral fin reaches to the vertical from the eighth anal ray. The dorsal and caudal fins spotted with brown, the first dorsal with a black blotch besides; the pectoral with brownish-black spots, and margined with blue.

Atlantic coasts of Tropical America.

a. Adult. Brazil. Presented by Lord Stuart.
b. Adult: skeleton. Brazil. Presented by Lord Stuart.
c–h. Adult and half-grown. Jamaica. From Dr. Parnell's Collection.
i. Half-grown. W. Indies.
k. Half-grown. Caribbean Sea. Presented by the Zoological Society as *Trigla serrata*.
l. Adult: stuffed.
m. Adult: stuffed.
n. Half-grown. Patagonia.
o. Adult. From the Haslar Collection.
p. Half-grown. From the Haslar Collection.
q–s. Half-grown: bad state. From the Haslar Collection.
t. Half-grown. From the Haslar Collection.
u. Half-grown. From Mr. Stokes's Collection.

Skeleton.—The maxillary and intermaxillary bones are situated below the prominent edge of the infraorbitals; the former is very long, reaching backwards nearly as far as the mandibulary, and rather slender, with the posterior extremity very broad. The intermaxillary is much shorter, tapering posteriorly, and has the posterior processes very short,—the mouth, therefore, being very little protractile. The mandibula is rather low, and exhibits irregular ridges on its outer surface. The vomer is broad anteriorly, with the edge elevated, and armed with a narrow strip of teeth, which is interrupted in the middle.

The infraorbital bones cuirasse completely the cheek; two series may be distinguished: a superior, entering into the lower half of the orbit and formed by two rather small bones; they are separated from the inferior series by a groove, by which the striae of the bones are interrupted. The inferior series is formed by three large, flat, striated bones, the striae of each bone radiating from a centre. The first bone is the praeorbital, subtriangular, with the centre (from which the striae radiate) situated in the middle of the anterior margin; it is placed horizontally, forming a great portion of the upper surface of the snout; its anterior margin is sharp, serrated; and there is a small spine, directed backwards, behind the centre mentioned. The second bone is the smallest, triangular, with two sides equal, and with the lower side shortest; the centre is situated in the middle of the lower side, and there is a spine behind it. The third bone is the largest, irregularly quadrangular, forming a long suture with the præoperculum. The point from which the striæ radiate is excentric below the true centre, and armed with a very small spine. A slight ridge, minutely serrated, runs from this point to the angle of the præoperculum.

The præoperculum and operculum form one continuous plane with the bones cuirassing the cheek. The former has a ridge across the angle, terminating in a strong spine; there is a small spine in the middle of the ridge, from which point the striæ radiate, with which both limbs are provided. The operculum is strongly striated, and has two ridges, terminating in spines, the lower of which is the stronger. The sub- and interoperculum are narrow and smooth.

All the bones on the upper surface of the skull are rough with tubercular striæ, radiating from the centre in each bone. The turbinal bones are well developed, touching each other in front of the ethmoid. The upper surface of the ethmoid* is quite free, subrhomboidal, twice as long as broad, and not extending on to the interorbital space. The præfrontals are large, forming a suture together in the median line of the skull; their orbital margin is armed with an obtuse point. The principal frontal bones do not extend anteriorly beyond the interorbital space, which is concave, and the width of which is less than the length of the vertical diameter of the orbit; they are truncated posteriorly, separated from the occipitals by an indistinct transverse groove; there is a spine on the posterior portion of the orbit, from which point the striæ radiate. The crown of the head is flat, broader than long, and the sutures between the single bones have nearly entirely disappeared, except the median one. The basal portion of the brain-capsule is slightly rounded; there is a foramen in the basisphenoid, immediately behind the occipital joint.

The suprascapula is firmly attached to the occipital, and terminates in a long horizontal spine; the scapula is oblong, broader inferiorly. The coracoid is nearly straight, with two slender curved processes for the junction with the scapula, and armed with a powerful spine immediately behind these processes. Each pubic bone has two limbs: the anterior is formed, as in other *Acanthopterygii*, by three lamellæ, the interior of which is the broadest; the anterior limbs of both bones converge towards the symphysis of the coracoids, leaving a wide free space between them, in which there is only a very short process. The posterior limb is directed inwards, emitting a long triangular process posteriorly; the symphysis of the pubic bones extends along the whole length of that process. The structure of the pectoral appendages and their junction with the carpal bones shows that they are merely detached pectoral rays.

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* An examination of the development of the bones of the skull may show that this is not the ethmoid itself, but a dermal plate corresponding to the ethmoid.

There are eleven abdominal and fifteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·75. The hæmal, neural, &c., spines are feeble.

4. Prionotus tribulus.

Cuv. & Val. iv. p. 98. pl. 74; *Dekay, New York Fauna, Fishes,* p. 48 pl. 70. f. 226 (bad).

D. 10 | 12. A. 11. L. lat. 52. Vert. 11/15.

The length of the head is rather more than one-third of the total; the space between the orbits is rather broad and concave, its width being more than that of the eye. The præorbital does not project beyond the snout. Several small spines between the præorbital and the præopercular spine; spines strong in the male. Pectoral appendages tapering; the pectoral fin reaches to the vertical from the eighth anal ray. The spinous dorsal with a black blotch between the fourth and sixth spines; the soft with series of brown spots. Back with two blackish spots at the base of the second dorsal, the second of which descends to the lateral line.

Southern coasts of the United States.

a. Fine specimen. New Orleans. Purchased of Mr. Cuming.
b. Adult: skeleton. New Orleans. Purchased of Mr. Cuming.
c. Fine specimen. Lake Champlain. Purchased of M. Parzudaki.
d–f. Adult males. Texas. Purchased of Mr. Brandt.
g. Air-bladder of specimen *b*.

The *skeleton* is extremely similar to that of *Prionotus punctatus*, and differs from it in the following points only:—

1. The second infraorbital of the lower series is nearly isoscelous, and its spine is situated, not on the lower margin, but at some distance above it.

2. The width between the orbits equals the length of the vertical diameter of the orbit.

5. Prionotus horrens.

Richards. Voy. Sulph. Ichth. p. 79. t. 42. f. 1–3.

D. 10 | 11. A. 9

Scales very small. The præorbital does not project beyond the snout. Spines of the head very strong, flat, triangular; the pectoral reaches to, or slightly beyond, the origin of the anal.

Coast of N.W. America.

a–c. Half-grown. Gulf of Fonseca (N.W. America). From the Haslar Collection.—Types of the species.

6. Prionotus miles.

Jenyns, Zool. Beagle, Fishes, p. 29. pl. 6.

D. 10 | 12. A. 11.

Præorbital slightly projecting beyond the snout, with six spinous teeth on each side; cheeks and temples without spines; no groove across the crown. The pectoral reaches to the vertical from the fourth anal ray. (*Jen.*)

Chatham Island (Galapagos Archipelago).

7. Prionotus birostratus.

Richards. Voy. Sulph. Ichthyol. p. 81. pl. 42. f. 4–6.

D. 9 | 10–12. A. 11.

Præorbital produced into an obtuse process, projecting beyond the snout. Head with the spines well developed. Pectoral truncated. Scales very small.

Gulf of Fonseca.

8. Prionotus japonicus.

Bleeker, Japan, p. 398, and *Verhand. Batav. Genootsch.* xxvi. *Japan,* p. 75. tab. 5. f. 1.

D. 9 | 14. A. 14. L. lat. 45–50.

Vertex and snout without spines; præorbital terminating in a flat, short, triangular, serrated disk; palatine teeth very minute, in a very narrow band; the pectoral reaches to the tenth anal ray, and is marked by a very large black blotch.

Sea of Japan.

44. LEPIDOTRIGLA.

Trigla, sp., *Cuv. & Val.*

Head parallelopiped, with the upper surface and the sides entirely bony; body with scales of moderate size, regularly arranged. Two dorsals, the first much shorter than the second. Three pectoral filaments. Villiform teeth in both the jaws and on the vomer, none on the palatine bones. Air-bladder generally with lateral muscles, often divided into two lateral parts; pyloric appendages in moderate number.

Mediterranean; East Indies; coast of Van Diemen's Land.

1. Lepidotrigla aspera.

Mullus asper, *Rondel.* x. c. 6. p. 296; *Gesner,* iv. p. 568; *Aldrov. Pisc.* ii. c. 2. p. 133; *Willughby,* iv. c. 7. p. 279. tab. S. 1. f. 2; *Ray, Syn.* p. 87.
Trigla cavillone, *Lacép.* iii. pp. 341, 366; *Risso, Hist. Nat.* iii. p. 396.
—— aspera, *Cuv. & Val.* iv. p. 77; *Bonap. Faun. Ital. Pesci*; *Guichen. Explor. Algér. Poiss.* p. 40; *Cuv. Règne Anim. Ill. Poiss.* pl. 20. f. 1.

D. 9 | 15. A. 15. L. lat. 50. Cæc. pylor. 6. Vert. 11/19.

Scales very regular, of moderate size, strongly serrated, those of the lateral line not spiny. The snout is very short, with the upper profile concave. Præorbital flattened and truncated in front, with several small spines. The pectoral reaches to the fourth anal ray. Pectoral with some cross-bands.

Mediterranean.

a. Adult. Sicily. Presented by W. Swainson, Esq.
b. Half-grown. Sicily. Presented by W. Swainson, Esq.
c. Half-grown. Dalmatia.
d, e. Half-grown. Purchased of Mr. Frank.
f. Half-grown. Purchased of Mr. Frank.

2. **Lepidotrigla papilio.**

Trigla papilio, *Cuv. & Val.* iv. p. 80. pl. 73.

D. 9 | 14. A. 14. L. lat. 55. Cæc. pylor. 7.

Scales very regular, of moderate size, with spines on the free margin, those of the lateral line with a spiny keel. Præorbital not projecting beyond the snout. The spines of the dorsal rather strong and bent; the spines along the base of the dorsal fin strong, prominent, compressed. The pectoral reaches to the sixth anal ray. The first dorsal with a black spot between the fourth and seventh spines. (*Cuv.*)

Indian Ocean.

3. **Lepidotrigla phalæna.**

Trigla phalæna, *Cuv. & Val.* iv. p. 83.

D. 9 | 15. A. 14.

Scales very regular, of moderate size, with spines on the free margin; those of the lateral line with a spiny keel. Præorbital not projecting beyond the snout. The spines of the dorsal rather slender and erect; the spines along the base of the dorsal fins slightly prominent. The pectoral with cross-streaks; the first dorsal with a black spot between the fourth and seventh spines. (*Cuv.*)

Hab. —— ?

4. **Lepidotrigla sphynx.**

Trigla sphynx, *Cuv. & Val.* iv. p. 83.

D. 9 | 14. A. 14. Cæc. pylor. 7.

Scales very regular, of moderate size, with spines on the free margin; those of the lateral line with a spiny keel. Præorbital not projecting beyond the snout. The spines of the dorsal not strong; the spines along the base of the dorsal fins strong, prominent, compressed. The first dorsal with a black, white-edged spot. (*Cuv.*)

Hab. —— ?

5. **Lepidotrigla vanessa.**

Trigla vanessa, *Richards. Proc. Zool. Soc.* 1839, p. 96, and *Trans. Zool. Soc.* iii. p. 83. pl. 5. f. 1.

D. 11 | 17. A. 17. L. lat. 70. Cæc. pylor. 8.

Scales very regular, of moderate size, those of the lateral line with very distinct spines. The snout is rather short, with the upper profile concave. Præorbital anteriorly with a triangular spine. The pectoral reaches to the seventh anal ray. Pectoral spotted.

Coast of Van Diemen's Land.

a. Adult. Port Arthur. From the Haslar Collection.—Type of the species.
b, c. Half-grown: not good state. From the Haslar Collection.
d, e. Half-grown: very bad state. From the Haslar Collection.

Sir John Richardson (*l. c.*) has given the numbers of the rays of the fins of these specimens as follows: D. 8 | 12. A. 12; but the artist has represented the correct numbers in the figures.

6. Lepidotrigla bürgeri.

Trigla bürgeri, *Temm. & Schleg. Faun. Japon. Poiss.* p. 35. pl. 14. f. 1, 2; *Bleeker, Verhand. Batav. Genootsch.* xxvi. *Japan*, p. 73.

D. 9 | 16. A. 16. L. lat. 60.

Scales very regular, of moderate size; those of the lateral line without spines. The snout is rather short, with the upper profile straight. Præorbital anteriorly with a flat triangular spine. The pectoral reaches to the fourth anal ray. Pectoral blackish, with the upper and lower margins yellowish.

Japanese and Chinese Seas.

a. Adult. China. Presented by Sir J. Richardson.
b. Young. China. Presented by J. R. Reeves, Esq.
c, d. Half-grown: have been dried.
e–g. Half-grown and young. From the Haslar Collection.

45. TRIGLA*.

Trigla, sp., *Artedi, Genera*, p. 42; *Cuv. Règne Anim.*; *Cuv. & Val.* iv. p. 9.

Head parallelopiped, with the upper surface and the sides entirely bony; body with exceedingly small scales, those of the lateral line sometimes larger. Two dorsals, the first much shorter than the second. Three pectoral filaments Villiform teeth in both the jaws and on the vomer, none on the palatine bones. Air-bladder generally with lateral muscles, often divided into two lateral parts; pyloric appendages in moderate number.

This genus is spread from the western coasts of Europe and the Mediterranean, round the Cape of Good Hope, through the Indian Ocean and Archipelago, to New Zealand. One European species crosses the Atlantic and is found at New York. Not yet found on the coast of Mozambique, Ile de France, and in the Red Sea.

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* 1. Trigla brandesii, *Bleek. Sclerop.* p. 24.—Banda Neira.
2. —— peronii, *Cuv. & Val.* iv. p. 53.—Indian Ocean.

1. Trigla pini.

Trigla cuculus, *L. Mus. Ad. Fried.* ii. p. 93, and *Syst. Nat.* p. 497; *Cuv. & Val.* iv. p. 26; *Dekay, New York Fauna, Fishes,* p. 43. pl. 70. f. 225; *Bonap. Faun. Ital. Pesci,* pl. . f. 2 (dorsal not good); *Yarrell, Brit. Fishes,* i. p. 38.
—— pini, *Bloch,* tab. 355; *Lacép. Hist. Nat. Poiss.* vi. p. 43; *Bl. Schn.* p. 14; *Risso, Ichth. Nice,* p. 206.
Polynemus tridigitatus, *Mitchill, Trans. Lit. & Phil. Soc. New York,* i. p. 449.

D. 8–9 | 18. A. 16–17. Cæc. pylor. 10. Vert. $\frac{15}{21-22}$.

Scales very small; the lateral line crossed by vertical folds of the skin. The upper profile of the snout descends abruptly and is concave, in older specimens less so than in younger ones. The space between the eyes is very concave, one-half, or little more than one-half the diameter of the eye. Præorbital anteriorly with short denticulations. The first dorsal spine tubercular; the second is the longest, and equal to, or even longer than, the distance between the tip of the snout and the angle of the præoperculum. The pectoral reaches to the vertical from the third or fourth anal ray. Uniform reddish-rose-coloured.

Mediterranean; Atlantic coasts of Europe; New York.

a–d. Adult: stuffed. English coast.
e. Adult: skin. England. From Mr. Yarrell's Collection.
f. Half-grown: skin. England. From Mr. Yarrell's Collection.
g. Fine specimen. Brighton. Presented by Dr. A. Günther.
h. Half-grown. Sicily. Presented by W. Swainson, Esq.
i. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.
k. Half-grown. Madeira. From the Haslar Collection.
l. Fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.
m. Half-grown. Lisbon. Presented by the Rev. R. T. Lowe.
n–p. Half-grown: bad state; have been in chloride of zinc.
q. Half-grown: not good state.
r, s. Adult: stuffed.
t. Adult: skin. Presented by the Zoological Society.
u. Large specimen: skeleton.

Skeleton.—The general structure of the bones is the same as in *Prionotus.* The maxillary and intermaxillary can be nearly entirely hidden below the prominent edge of the infraorbitals; the former does not reach as far backwards as the mandibulary, and becomes gradually broader posteriorly. The intermaxillary is much shorter, tapering, and has the posterior processes very short. The mandibula is rather low. The vomer is broad anteriorly, with an elevated and toothed edge; the band of teeth is not interrupted in the middle. The infraorbital bones are arranged in two series: a superior, formed by two small bones, and entering the orbit, and an inferior, formed by three larger bones, and cuirassing the cheek. The first is the præorbital, subtriangular, with the anterior margin rather swollen and granular; the second is elongate, subtriangular, situated along the lower edge of the cheek, and reaching to the præoperculum;

the third is the largest, subquadrangular, and situated between the second, the præfrontal, the upper series of infraorbitals, and the præoperculum. None of these bones have any spines or ridges. The præoperculum and operculum form one continuous plane with the bones cuirassing the cheek. The former has a very slight ridge across the angle, which is provided with two obtuse points; it is obliquely situated, and its lower limb is reduced almost to nothing. The operculum has no distinct ridge, but two spines, separated from each other by a crescent-shaped notch; the sub- and interoperculum are narrow and smooth.

The turbinal bones are large, triangular, touching each other in front of the ethmoid. The upper surface of the ethmoid is quite free, rhombic, twice as long as broad, and not extending between the orbits. The præfrontals are large, subrhomboidal, touching each other behind the ethmoid; their orbital margin is provided with some obtuse points. The principal frontal bones do not extend anteriorly beyond the interorbital space, which is rather concave, and the width of which is much less than the length of the vertical diameter of the orbit. The crown of the skull is quite flat, nearly twice as broad as long; the sutures have entirely disappeared. The basal portion of the brain-capsule is rather compressed; the basisphenoid is narrow, with a small foramen behind the occipital joint.

The suprascapula is firmly joined to the occipital, and terminates in a short spine. The scapula is oblong, broader inferiorly. The coracoid is nearly straight, with two short processes for its junction with the scapula, and with a powerful, flat, triangular spine immediately behind these processes. The three free pectoral appendages articulate with the two lower bones of the carpus. Each pubic bone has two limbs: the anterior is formed by three lamellæ, the interior and inferior of which are the broadest; the anterior limbs of both bones converge towards the symphysis of the coracoids, leaving a wide free space between them: the posterior limb, with its fellow, forms a regular triangular plate, emitting anteriorly a very long and slender process, which reaches nearly to the symphysis of the coracoids. The whole structure of the pelvis constitutes a very solid base for the muscular apparatus of the ventral fins.

There are fifteen abdominal and twenty-two caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·75. The anterior vertebræ are rather compressed in their longitudinal diameter. Each interneural spine has a longitudinal and a transverse ridge; superiorly it widens into two bony wings, which together form the exterior cuirass, in which the dorsal fins move.

2. **Trigla lineata.**

Mullus imberbis, *Rondel.* x. c. 5. p. 295; *Gesner*, iv. p. 567; *Aldrov.* ii. c. 2. p. 131; *Willughby*, iv. c. 7. p. 278. tab. S. 1. f. 1; *Ray, Syn.* p. 87.

Cuculus lineatus, *Ray, Syn.* p. 165. tab. 2. f. 11.

Trigla lineata, *L. Gm.* i. p. 1345; *Bl.* taf. 354; *Bl. Schn.* p. 13; *Cuv. & Val.* iv. p. 34; *Bonap. Faun. Ital. Pesci*; *Yarrell, Brit. Fishes*, i. p. 45; *Guichen. Explor. Algér. Poiss.* p. 38.

Trigla lastoviza, *Brünn. Pisc. Mass.* p. 99; *Lacép.* iii. pp. 340, 351.
—— adriatica, *L. Gm.* i. p. 1346; *Bl. Schn.* p. 15; *Risso, Ichth. Nice,* p. 204, and *Hist. Nat.* iii. p. 394; *Martens, Reise nach Venedig,* ii. p. 430. tab. 11.
Duhamel, Pêches, v. tab. 8. f. 5.

D. 10–11 | 16–17. A. 16. L. lat. 65. Cæc. pylor. 10. Vert. 15/20.

Scales very small; those of the lateral line much larger, and with a denticulated keel; the sides crossed by vertical folds of the skin. The upper profile of the snout descends very abruptly, approaching the vertical line, and is very slightly concave. The space between the eyes is deeply excavated, and two-thirds the diameter of the eye. Præorbital anteriorly obtuse, granulated. The first dorsal spine, and sometimes the second and third, tubercular; the second is equal to the distance between the tip of the snout and the angle of the præoperculum. The pectoral reaches to the vertical from the seventh or eighth anal ray. Red: head and body dotted with brown; pectorals with larger blue spots, forming cross-bands.

Mediterranean; western coasts of Europe.

a. Adult: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
b. Adult: skin. From Mr. Yarrell's Collection.
c, d. Adult: stuffed.
e. Adult. Lisbon.
f. Fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.
g. Half-grown. Madeira. Presented by the Rev. R. T. Lowe.
h. Half-grown. Sicily. Presented by W. Swainson, Esq.
i. Young: bad state. Sicily. Presented by W. Swainson, Esq.
k. Adult. Dalmatia.
l. Half-grown. Adriatic. From Mr. Frank's Collection, as Trigla aspera.
m. Half-grown.
n. Half-grown. From Mr. Frank's Collection.
o. Young.
p. Adult: skeleton. Madeira. Presented by the Zoological Society.
q. Adult: skeleton.

The *skeleton* differs very little from that of *Trigla pini*: the ethmoid is three times as long as broad; the præfrontals do not touch each other, and are armed with prominent spines at the orbital margin. There are fifteen abdominal and twenty caudal vertebræ, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·5.

3. Trigla hemisticta.

Temm. & Schleg. Faun. Japon. Poiss. p. 36. pl. 14. f. 3, 4, pl. 14. B.

D. 7 | 11. A. 11.

Scales very small, those of the lateral line a little larger, with a feeble and roughened keel. The snout is moderately elongate; the interspace between the eyes is rather more than the width of the orbit. Præorbital produced into a long, flat, triangular spine. Præoperculum and operculum with a keel, terminating in a spine; the opercular spine exceedingly strong and grooved. Dorsal spines rather strong, the third and fourth are the longest. Back spotted with brown; the second dorsal with a series of brown spots, the first with a large black blotch. (*Schleg.*)

Sea of Japan.

4. Trigla pleuracanthica.

Richards. Voy. Ereb. & Terr. Ichthyol. p. 23. pl. 16. f. 1-4.

D. 8 | 14. A. 14. L. lat. 55.

Along the lateral line a series of imbricate scaly plates, each angularly bent, and the edge terminating in a strong spine. The other scales small. The snout is of moderate extent, with the upper profile slightly concave.

Sydney Cove.

a, b. Half-grown: very bad state; have been in chloride of zinc. Sydney. From the Haslar Collection.—Types of the species.

5. Trigla hirundo.

Corax, *Rondel. Pisc.* i. lib. 10. cap. 7; *Gesner, Aquat.* iv. p. 299; *Aldrov. Pisc.* ii. cap. 57; *Willughby, Ichth.* iv. p. 280; *Ray, Syn. Pisc.* p. 87.
Corvus, *Salv. Hist. Aquat.* p. 194. f. 71.
Hirundo, *Aldrov. Pisc.* ii. cap. 3. p. 133; *Willughby,* p. 280; *Ray,* p. 88.
Lucerna Venetorum, *Willughby,* iv. p. 281; *Ray,* p. 88.
Trigla cuculus, *Brünn. Pisc. Mass.* p. 77; *Gronov. Syst. ed. Gray,* p. 105.
—— hirundo, *Bl.* taf. 60; *Bl. Schn.* p. 15; *Lacép.* iii. p. 353; *Risso, Ichth. Nice,* p. 205; *Cuv. & Val.* iv. p. 40; *Parn. Fishes Frith of Forth,* p. 16. pl. 20; *Yarrell, Brit. Fishes,* i. p. 47; *Guichen. Explor. Algér. Poiss.* p. 39.
? Trigla hyrax, *Pall. Zoogr.* p. 238; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 375.
Trigla corvus, *Risso, Hist. Nat.* iii. p. 398.
—— corax, *Bonap. Faun. Ital. Pesci,* pl. . f. 1.
Skeleton: *Rosenthal, Ichthyologische Tafeln,* tab. 18. f. 1.

D. 9 | 16 (17). A. 16. Cæc. pylor. 8. Vert. $\frac{14-15}{19}$.

Scales extremely small, those of the lateral line without any armature. The snout is rather elongate, with the upper profile nearly straight. The space between the eyes is concave, and its width equal to the diameter of the eye. Præorbital anteriorly with prominent spines; the first dorsal spine somewhat tubercular; the second is the longest, and equal to the distance between the posterior nostril and the angle of the præoperculum. The pectoral reaches to the vertical from the eighth (seventh) dorsal ray. Brownish-red; pectorals blackish, margined with blue.

Mediterranean; western coasts of Europe.

a. Adult. Dalmatia.
b. Half-grown. Sicily. Presented by W. Swainson, Esq.
c. Half-grown. Bay of Naples. Presented by S. P. Pratt, Esq.

d. Half-grown. Island of Cerigo. From the Collection of the Zoological Society.
e. Adult. Lisbon.
f. Fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.
g. Half-grown. Lisbon. Presented by the Rev. R. T. Lowe.
h. Adult: stuffed.
i. Adult: skin. From Mr. Yarrell's Collection.
k. Adult: skin. From Gronow's Collection.

6. **Trigla capensis.**

Cuv. & Val. iv. p. 55.

D. 9 | 16. A. 16.

Scales extremely small, those of the lateral line without any armature. The snout is elongate, with the upper profile straight; the space between the eyes is slightly concave, and its width equals the diameter of the eye. Præorbital anteriorly with about four prominent points. The first dorsal spine is very slightly granular; the second is the longest, and rather more than the distance between the anterior nostril and the angle of the præoperculum. The pectoral reaches to the vertical from the seventh dorsal ray. Brownish-red; pectoral blackish.

Cape Seas.

a. Twenty-two inches long: stuffed. Cape Seas. Presented by Sir A. Smith.
b. Half-grown: bad state; has been in chloride of zinc. Cape Seas. From the Haslar Collection.
c. Adult: stuffed: not good state. Cape Seas. Presented by the Zoological Society.

7. **Trigla pœciloptera.**

Cuv. & Val. iv. p. 47; *Thomps. Proc. Zool. Soc.* 1837, p. 61; *Yarrell, Brit. Fishes,* i. p. 49; *Demid. Voy. Russ. Mérid.* iii. p. 375; *Guichen. Explor. Algér. Poiss.* p. 39.

D. 9 | 17. A. 15.

Scales extremely small, those of the lateral line without any armature. The snout is elongate; the space between the eyes concave. Præorbital anteriorly with small points; a rather prominent ridge along the præorbital and the angle of the præoperculum. Three spines between the orbit and the suprascapula. Pectoral with a large black spot, dotted with pure white.

Shores of Dieppe; Youghal in Ireland; Black Sea.

8. **Trigla pauciradiata.**

Bennett, Proc. Zool. Soc. iii. p. 91.

D. 6 | 16. A. 15.

The upper profile of the snout descends in a gently oblique line. Præorbital anteriorly with small points, scarcely projecting beyond the snout. Pectoral fins large, with the inside blue, with some un dulated bands at the extremity, and with a dark blotch on the lower half, dotted with white. (*Benn.*)

Coast of Trebizond.

This fish is probably identical with *T. pœciloptera*, if the number of the dorsal spines were accidental in the specimen examined by Mr. Bennett.

9. Trigla kumu.

Trigla kumu, *Less. & Garn. Coqu. Poiss.* pl. 19; *Cuv. & Val.* iv. p. 50; *Jenyns, Zool. Beagle, Fishes,* p. 27; *Faun. Japon. Poiss.* p. 37. pl. 14 A. f. 3; *Owen, Osteol. Catal.* i. p. 55; *Bleek. Verhand. Batav. Genootsch.* xxvi. *Japan,* p. 74.

Trigla spinosa, *M'Clelland, Calc. Journ. Nat. Hist.* iv. p. 396. pl. 22. f. 2.

D. 9–10 | 16–17. A. 15. Cæc. pylor. 6.

Scales extremely small, those of the lateral line without any armature. The snout is elongate and its upper profile straight. The space between the eyes is concave, and its width is less than the diameter of the eye. Præorbital anteriorly with obtuse points; there is no prominent ridge along the præorbital and the angle of the præoperculum; no spine between the orbit and the suprascapula. The first dorsal spine is smooth, or very little granular; the second is the longest, and equal to the distance between the anterior nostril and the angle of the præoperculum. The pectoral reaches to the vertical from the tenth dorsal ray. Reddish-brown; the pectorals with a large black blotch, and white spots in variable number.

From New Zealand to the coasts of China.

Var. A. *kumu.* A bluish-black blotch on the lower half of the pectoral, with six or eight white spots.

a. Adult. New Zealand. Presented by the Lords of the Admiralty.
b. Half-grown. New Zealand. Presented by the Lords of the Admiralty.
c. Many half-grown specimens. New Zealand. From the Haslar Collection.
d. Half-grown. Australia. Presented by the Earl of Derby.
e. Adult: stuffed. Australia. Purchased of Mr. Warwick.
f. Half-grown.
g. Half-grown: not good state. From the Haslar Collection.

Var. B. *spinosa.* Bluish-white spots extending over nearly all the lower half of the pectoral fin.

h. Adult. China. Presented by J. R. Reeves, Esq.
i. Half-grown. Hongkong. Presented by J. C. Bowring, Esq.

10. Trigla polyommata.

Trigla polyommata, *Richards. Proc. Zool. Soc.* 1839, p. 96, and *Trans. Zool. Soc.* iii. p. 87. tab. 5. f. 2.

D. 7 | 13. A. 12. Cæc. pylor. 8.

Scales exceedingly small. Præorbital, suprascapula, coracoid, operculum, and præoperculum with very strong and long spines. The space between the eyes is very concave, and equals the diameter of the eye. Dorsal spines rather stout. The pectoral reaches to the vertical from the tenth anal ray. Back reddish-olive, belly silvery; the lower portion of the pectoral with several black spots, edged with white.

Coasts of Van Diemen's Land.

a. Half-grown. Tasmania. Presented by Sir J. Richardson.—Type of the species.
b. Half-grown. Port Arthur. From the Haslar Collection.
c. Young. Port Arthur. From the Haslar Collection.

11. **Trigla gurnardus.**

Coccyx alter, *Bellon.* i. p. 207.
Cornatus s. Gurnardus griseus, *Willughby*, iv. c. 7. p. 279. tab. S. 2. f. 1; *Ray, Synops.* p. 86.
Trigla, sp. 8, *Artedi, Genera*, p. 46.
Trigla, sp. 101, *Gronov. Mus. Ichth.* p. 44, and *Zoophyl.* sp. 283. p. 84.
Corystion, *Klein, Miss.* iv. pl. 14. f. 2.
Trigla gurnardus, *L. Syst. Nat.* i. p. 497; *L. Gm.* i. p. 1342; *Lacép.* iii. p. 358; *Bl.* taf. 58; *Bl. Schn.* p. 14; *Risso, Ichth. Nice*, p. 207; *Faber, Fische Islands*, p. 124; *Cuv. & Val.* iv. p. 62; *Bonap. Faun. Ital. Pesci*, pl. . f. 2; *Parn. Fishes Frith of Forth*, p. 18. pl. 22; *Yarr. Brit. Fishes*, i. p. 53.
Trigla aspera, *Gronov. Syst. ed. Gray*, p. 105.
Duhamel, v. pl. 9. f. 1.

D. 8–9 | 19. A. 18–19. Cæc. pylor. 7. Vert. $\frac{14}{24}$.

The snout is elongate, with the upper profile straight; the space between the eyes is little concave, and less than the diameter of the eye. Præorbital anteriorly with some small prominent spines. The bony plates along the base of the dorsal fins have a crenulated edge, and no spine directed backwards. The dorsal spines granulated, rather strong: the second is the longest, and equal to the distance between the extremity of the snout and the posterior margin of the orbit. Along the lateral line a series of bony plates, each with a crenulated crest. The pectoral does not reach to the vertical from the origin of the anal. Back brownish-grey, spotted with white; the first dorsal generally without a black marginal spot.

Mediterranean; western coasts of Europe; Iceland.

a. Adult. English coast.
b. Adult: skin. Plymouth. From Mr. Yarrell's Collection.
c. Adult: stuffed. Hastings.
d, *e*. Half-grown: skins. English coast. From Mr. Yarrell's Collection.
f. Half-grown: stuffed. English coast.
g. Adult: stuffed. Frith of Forth. Presented by Dr. Parnell.
h. Half-grown: stuffed. River Tamar. Presented by Lieut. H. F. Spence, R.N.
i. Adult: stuffed. Polperro.

k. Adult: stuffed.
l. Half-grown: skin.
m. Half-grown: skin. From Gronow's Collection.
n–p. Adult: skeletons: not good state. English coast.

*Skeleton**.—The bones of the upper jaw can be nearly entirely hidden below the prominent edge of the præorbital; the maxillary reaches as far backwards as the mandibulary, and becomes gradually broader posteriorly. The intermaxillary is shorter, has a flat prominence behind, and the posterior processes very short. The mandibula is rather low, and has some irregular longitudinal grooves, and a few pores inferiorly. The vomer is very broad, with the anterior edge swollen and with a longitudinal groove along the median line. The teeth form a band, which is narrowest in the middle. The palatine bones are subelliptical, with the posterior portion produced and bent downwards. There is a single, exceedingly large bone, cuirassing the cheek; it extends from the extremity of the snout to the interior edge of the præoperculum, and from the mandibulary joint to the anterior angle of the orbit; the anterior portion of its lower edge is swollen, porous, and obtusely crenated; the point from which the striæ of the bone radiate, is situated a little above the middle of the lower margin; a series of pores corresponds to every stria, and there is a granule of enamel in many of the pores. The lower margin of the orbit appears to be formed by a single, narrow, elongate suborbital, whilst there are two in other species of *Trigla* and *Prionotus*. The præoperculum and operculum form one continuous plane with the præorbital; the former has a slight ridge (scarcely visible) across the angle, which is provided with two obtuse points; it is obliquely situated, and its lower limb is reduced almost to nothing. The operculum has no distinct ridge, but two spines, separated from each other by a deep notch; there is another semicircular notch above the upper spine. The sub- and interoperculum are narrow and smooth.

The ethmoidal bone is large, sexangular, 1½ as long as broad, and separates the turbinal and præfrontal from their fellows. The turbinal bones are large, triangular. The præfrontals are well developed, rather elongate, overreaching the anterior portion of the orbit, and armed with a stout point. The principal frontal bones are subtruncated anteriorly, and do not extend beyond the interorbital space, which is very slightly concave, and the width of which is much more than the length of the horizontal diameter of the orbit. The crown of the skull is quite flat, twice as broad as long; the sutures have entirely disappeared. There is no occipital crest at all. The basal portion of the brain-capsule is neither compressed nor swollen; the basisphenoid is rather narrow, flat.

The suprascapula is firmly joined to the occipital, forming a portion of the upper surface of the skull, and terminates posteriorly in a flat spine. The scapula is oblong, broader inferiorly. The humerus* is nearly straight, with two short processes for the junction with the scapula, and with a flat, triangular, ridged spine immediately behind the processes mentioned. The epicoracoid is suspended at the inner side of the spine, and is a single, styliform, rib-like bone. The ulna and radius are separated from each other by a wide free space: the former is situated before the upper carpal bone, and is similar in size and shape to one of the larger carpal bones; the radius is elongate, triangular, with a small foramen in the middle. There are four carpal bones, the upper of which is small; the pectoral appendages are articulated to the two lower ones. Each pubic bone has two limbs: the anterior is formed by three lamellæ, the interior and inferior of which are the broadest; the anterior limbs of both bones converge towards the symphysis of the coracoids, leaving a cordate free space between them. The posterior limb, with its fellow, forms a regularly triangular plate, emitting anteriorly a very long and slender process, which reaches nearly to the other extremity of the free space. There is no glossohyal; the urohyal is a simple vertical plate.

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* The description of the bones of the head is taken from a skull in my own collection, eight inches long; the fish was taken off the Brighton coast.

There are fourteen abdominal and twenty caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·55. The three anterior vertebræ are rather compressed in their longitudinal diameter. The structure of the interneural spines is the same as in *T. pini*. The above description is taken from a specimen twenty-four inches in length, probably a female.

In specimens fifteen inches in length, the number of abdominal *vertebræ* is the same, viz. fourteen; but that of the caudal portion is twenty-four; and the ratio of the lengths of both portions is 1 : 1·86. Perhaps these fishes are males.

12. **Trigla cuculus.**

Milvus, *Rondel.* x. c. 8. p. 297; *Aldrov.* ii. c. 58. p. 279.
Trigla cuculus, *Bloch*, ii. p. 124. tab. 59; *Bl. Schn.* p. 14; *Risso, Ichth. Nice*, p. 208 (not *Hist. Nat.*).
—— milvus, *Lacép.* iii. pp. 340, 362; *Risso, Hist. Nat.* iii. p. 395; *Cuv. & Val.* iv. p. 67; *Bonap. Faun. Ital. Pesci*, pl. . f. 3.
—— blochii, *Yarrell, Brit. Fishes*, i. p. 56.
Triglæ gurnardi var., *Parn. Fishes Frith of Forth*, p. 21. pl. 23.

D. 9 | 19. A. 19. Cæc. pylor. 5. Vert. $\frac{13}{24}$.

The snout is elongate, with the upper profile straight; the space between the eyes is slightly concave, and less than the diameter of the eye. Præorbital anteriorly with some small prominent spines. The bony plates along the base of the dorsal fin have smooth edges, each terminating posteriorly in a spine. The dorsal spines are robust:

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* Prof. Owen retains the name of 'humerus' for the same bone to which it has been applied by Cuvier and the German anatomists, whilst he alters the name of 'coracoid' into that of 'epicoracoid' (see *Archetype*). Owing to a misrepresentation of Prof. Owen's theory in Sir J. Richardson's *Ichthyology*, in all my foregoing descriptions the 'coracoid' has been called the 'humerus,' and *vice versâ*.

the first is slightly granulated; the second is the longest, its length being rather less than the distance between the extremity of the snout and the posterior margin of the eye. Along the lateral line a series of bony plates, each with a crenulated crest. The pectoral does not reach to the origin of the anal fin. Red; the first dorsal generally with a black marginal spot.

Mediterranean; western coasts of Europe.

a, *b*. Half-grown. British Channel. From the Haslar Collection.
c. Many young specimens. Weymouth. Presented by Mr. M. W. Thompson.
d. Half-grown: skin. Frith of Forth. From Mr. Yarrell's Collection.
e. Half-grown: stuffed. Frith of Forth. From Dr. Parnell's Collection.
f. Half-grown. Dalmatia.
g. Adult: stuffed.
h. Adult. From the Haslar Collection.

This fish is considered by several ichthyologists as a variety of immature specimens of *Trigla gurnardus*, which appears to me very probable, from the examination of preserved specimens. The identity or non-identity of these fishes can be proved only by a continued examination of them on different parts of the coast.

13. **Trigla lyra.**

Lyra, *Rond.* x. c. 9. p. 298; *Gesn.* iv. p. 516; *Aldror.* ii. c. 7. p. 146; *Willughby*, iv. p. 282; *Ray, Syn.* p. 89; *Duham. Pêches*, sect. v tab. 8. f. 1.
Cuculus, *Salv.* p. 190. f. 70; *Willughby*, tab. S. 2. f. 2.
Trigla, sp. 9, *Artedi, Genera*, p. 46.
—— lyra, *L. Syst. Nat.* i. p. 469; *L. Gm.* i. p. 1342; *Lacép.* iii. pp. 339, 345; *Bl.* tab. 350; *Bl. Schn.* p. 14; *Risso, Ichth. Nice*, p. 203, and *Hist. Nat. Eur. Mérid.* iii. p. 393; *Cuv. & Val.* iv. p. 55; *Bonap. Faun. Ital. Pesci*; *Yarrell, Brit. Fishes*, 2nd edit. i. p. 51; *Guichen. Explor. Algér. Poiss.* p. 39.

D. 9–10 | 16–17. A. 16. Vert. 13/20.

Scales very small, those of the lateral line without any armature. The snout has the upper profile concave, and is distinguished by two very broad triangular plates, in which the præorbital terminates. The space between the eyes is very slightly concave, and its width is three-fifths of the diameter of the eye. Dorsal spines stout: the third is the longest, and equal to the distance between the anterior nostril and the angle of the præoperculum. The spines along the base of the dorsal fin are very stout and broad. Uniform red.

Mediterranean; coasts of the Peninsula, France, and England.

a. Adult: skin. England. From Mr. Yarrell's Collection.
b. Fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.
c–e. Adult. Lisbon. Presented by the Rev. R. T. Lowe.
f. Adult: skeleton: several bones are lost or injured.

Skeleton.—The bones of the upper jaw can be entirely hidden below the prominent edge of the præorbital; the maxillary reaches nearly as far backwards as the mandibula, and becomes gradually somewhat broader posteriorly. The intermaxillary is shorter, has a flat and sharply projecting prominence behind, and the posterior processes very short. The mandibula is rather low. The vomer is very broad and quite flat, the anterior edge, however, being somewhat elevated. The following bones, cuirassing the cheek, may be distinguished:—

a. The middle one is the largest, subquadrangular, extending from the vicinity of the nostril to the interior edge of the præoperculum, to which it is firmly joined. It does not enter the orbit, nor does it reach to the lower margin of the infraorbital bones. Fine granulated striæ proceed from its centre in every direction, that running towards the angle of the præoperculum being more prominent than the rest, and forming a slight ridge.

b. An upper series is formed by two narrow bones, constituting the inferior margin of the orbit. The posterior one is attached to the præoperculum.

c. An inferior series is formed by three bones, constituting the lower margin of the snout, below which the jaw-bones are hidden. The anterior is the præorbital, forming a suture posteriorly with the middle bone, and projecting anteriorly far beyond the cleft of the mouth. The two other bones gradually taper posteriorly, and the posterior touches the præoperculum. The structure of the striæ of these bones is the same as in *T. gurnardus*.

The præoperculum and operculum form one continuous plane with the infraorbitals; the former has a slight ridge across the angle, which is provided with an obtuse point; it is obliquely situated, and its lower limb is almost reduced to nothing. The operculum has a distinct ridge, terminating in a powerful spine. There are two deep notches above this spine, separated from each other by a slender projecting point. The sub- and interoperculum are narrow and smooth.

The ethmoid is large, pentagonal, 1½ as long as broad, and separates the turbinal bone from its fellow; the latter is well developed, irregularly shaped. The præfrontal is exceedingly large, and forms a long suture with that of the other side; it is armed with a spine above the orbit, the upper and anterior angle of which is formed by it. The principal frontal bones are subtruncated anteriorly, and, in consequence of the great development of the præfrontals, they do not extend beyond the interobital space; they are scarcely longer than the præfrontals, flat, and very slightly concave between the orbits. The width of the interorbital space is less than the length of any of the diameters of the orbit. The crown of the head is flat, slightly convex on the sides, and about twice as broad as long. The occipital is quadrangular, rather broader than long. The suprascapula appears to be composed of three pieces: the anterior joined to the frontal and occipital, the middle and smallest one joined to the occipital alone, and the posterior terminating in a long, flat, triangular spine. These bones constitute the lateral portion of the crown of the head. The basal portion of the brain-capsule is rather compressed.

The scapula is oblong, broader inferiorly. The coracoid is nearly straight, with two short processes for its junction with the scapula, and with an exceedingly long and strong, ridged, bayonet-shaped spine. The humerus is suspended at the inner side of the base of that spine, and is a single, styliform, rib-like bone. The ulna and radius are separated from each other by a wide free space: the former is situated before the upper carpal bone, and is similar in size and shape to one of the larger carpal bones; the radius is somewhat elongate, triangular, provided with a small foramen in the middle, like the ulna. There are four carpal bones, the upper of which is small; the pectoral appendages are articulated to the two lower ones. Each pubic bone has two limbs: the anterior is formed by three lamellæ, the interior and inferior of which are the broadest, and the inferior has the margin flattened; the superior lamella is scarcely developed; the anterior limbs of both bones converge towards the symphysis of the coracoids, leaving a small round opening between them. The posterior limb, with its fellow, forms a regularly triangular plate, emitting anteriorly a long process.

There are thirteen abdominal and twenty caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 2. The zygapophyses of the last three or four abdominal vertebræ are singularly widened, and form a smooth concavity at the lower side of the vertebræ.

14. Trigla obscura.

Cuculus, *Rondel. Pisc. Mar.* i. lib. x. cap. 2; *Gesn. Aquat.* iv. p. 305; *Aldrov.* ii. cap. 4. p. 138.
Trigla obscura, *L. Mus. Ad. Fried.* ii. p. 94; *Bl. Schn.* p. 16; *Bonap. Faun. Ital. Pesci*, f. 1.
—— lucerna, *Brünn. Pisc. Mass.* p. 76; *Risso, Ichth. Nice*, p. 209; *Cuv. & Val.* iv. p. 72. pl. 72; *Yarrell, Brit. Fishes*, ed. 2. i. p. 63; *Parn. Fishes Frith of Forth*, p. 23. pl. 24; *Guichen. Explor. Algér. Poiss.* p. 40.
—— cuculus, *Risso, Hist. Nat.* iii. p. 394.
—— filaris, *Otto, Conspect.* pp. 7 & 8.

D. 10 | 17–18. A. 17. L. lat. 68. Cæc. pylor. 8. Vert. $\frac{12}{23}$.

Scales small; along the lateral line a series of large striated scales. The second dorsal spine filiform, and much longer than the head.

Mediterranean; western coasts of Europe.

a. Adult. Sicily. Presented by W. Swainson, Esq.
b. Fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.
c. Adult.
d. Adult: stuffed. From Mr. Yarrell's Collection.
e. Adult: skin. Plymouth. From Mr. Yarrell's Collection.
f. Adult: skin. From Mr. Yarrell's Collection.

Fourth Group. CATAPHRACTI.

Triglidæ with the body completely cuirassed by bony keeled scales or plates. Pyloric appendages in small or moderate number.

46. AGONUS*.

Agonus, *Bl. Schn.* p. 104.
Aspidophorus, *Lacép.* iii. p. 221; *Cuv. & Val.* iv. p. 198.
Phalangistes, *Pallas, Zoogr. Rosso-Asiat.* iii. p. 110.

Head and body angular, covered with bony plates. Lateral line present. Two dorsals; no pectoral appendages; pectoral simple. Teeth in the jaws, and, in one species, also on the vomer. Air-bladder none; pyloric appendages in small number.

Northern parts of the temperate zone; one species reaching southwards to the coasts of Great Britain, others to the coast of Chile.

1. Agonus cataphractus.

Cataphractus, *Schonev. Ichth.* p. 30. pl. 3; *Willughby*, p. 211; *Ray*, p. 77.
Cottus, sp. 4, *Artedi, Genera*, p. 49, *Spec.* p. 87; *Gronov. Zoophyl.* no. 271; *Klein, Miss.* iv. p. 42.
Seba, iii. 28. 6.
Cottus cataphractus, *L. Syst.* i. p. 451; *L. Gm.* p. 1207; *Bl.* taf. 39. f. 3, 4; *Donov. Brit. Fishes*, i. pl. 16; *Faber, Faun. Grœnl.* p. 155; *Faber, Fische Islands*, p. 117; *Gronov. Syst. ed. Gray*, p. 103.
Agonus cataphractus, *Bl. Schn.* p. 104; *White, Catal. Brit. Mus.* p. 7.
Cataphractus schoneveldii, *Flem. Brit. An.* p. 216.
Aspidophorus armatus, *Lacép.* iii. p. 222.
—— europæus (!), *Cuv. & Val.* iv. p. 201; *Yarrell, Brit. Fishes*, ed. 2. i. p. 85; *Parn. Fishes Frith of Forth*, p. 28; *Richards. Faun. Bor. Amer.* iii. p. 48.
—— cataphractus, *Jen. Man.* p. 346; *Fries och Ekstr.* p. 167. t. 40.

D. 5 | 6. A. 6. L. lat. 32. Cæc. pylor. 5. Vert. 11/25.

Two dorsals. Vomerine teeth none. Angle of mouth and chin with many small barbels; two pairs of spines above the snout, no other spines on the upper side of the head. The space before the ventrals covered with four square plates. Space between the eyes larger than their diameter. Body with brown cross-bars.

Coasts of Great Britain; German Ocean; Baltic; Iceland; Greenland.

a. Adult. English coast.
b. Adult: stuffed. English coast.
c–f. Adult and half-grown. Devonshire. Museum Leach.
g–i. Adult: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
k. Adult. Frith of Forth.
l. Adult. Frith of Forth. Museum Leach.

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* 1. Agonus lævigatus, *Tiles. Mém. Acad. Pétersb.* iv. p. 436, and *Mém. Soc. Natur. Mosc.* ii. p. 216. pl. 14; *Cuv. & Val.* iv. p. 214; *Cuv. Règne Anim. Ill. Poiss.* pl. 21. f. 2.—Island of Sagalien.

m. Adult: stuffed. Frith of Forth.
n. Half-grown. Frith of Forth.
o. Adult: dried. Frith of Forth. Museum Leach.
p. Adult and half-grown.
q, *r*. Adult. From the Haslar Collection.
s, *t*. Half-grown.
u–*z*. Half-grown.
α. Adult.
β. Adult: dried. From Mr. Yarrell's Collection.
γ, *δ*. Adult: dried.
ε, *ζ*. Adult: skin.
η, *θ*. Adult: skins. From Gronow's Collection.
ι. Adult female: skeleton: bad state. From the Haslar Collection.

The *skeleton* shows several interesting peculiarities: the two turbinal bones are grown together, and situated in front of the snout, where they form a flat prominence, superiorly with two pairs of strong curved spines; they occupy the same place as the rostral shield in snakes, and are somewhat similar to it. The intermaxillary and maxillary are concealed beneath the edges of the turbinal and infraorbital bones; the former is only half the length of the latter; the mandibulary is low, with several wide grooves leading into the muciferous channel in the interior of the bone. The infraorbitals are very solid, and firmly joined to the turbinal and to the præoperculum; their inferior edge is swollen, with a muciferous channel in the interior, and with three large grooves; the posterior of the bones has a spine in its centre directed backwards and upwards. The præoperculum has both the limbs of equal length, and meeting at an acute angle, which is armed with a spine; the muciferous channel of the lower jaw is continued over both its limbs. The operculum is triangular and striated, like the other bones of the skull. The anterior frontals are small, without any prominence, and form the front part of the orbit. The principal frontals are broad, their width between the orbits being much more than that of the orbit. The interorbital space is concave. Each occipital bone and suprascapula has a very obtuse prominence, from which minute striæ radiate. The lower part of the brain-capsule is broad and flat.

There are eleven abdominal and twenty-five caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 2·17. The ribs are thin and fragile; the hæmal, neural, interhæmal and interneural spines are exceedingly feeble and short.

2. Agonus acipenserinus.

Phalangistes acipenserinus, *Pall. Zoogr. Rosso-Asiat.* iii. p. 110. tab. 17.
Agonus acipenserinus, *Tiles. Mém. Acad. St. Pétersb.* 1813, iv. p. 422. pl. 11. fig. 1–3.
Aspidophorus acipenserinus, *Cuv. & Val.* iv. p. 207.

B. 6. D. 8 | 7. A. 8. C. 13. V. 1/2. L. lat. 37. Vert. 12/27.

Two dorsals, continuous at the base. Vomerine teeth none.

Snout very prominent, with the cleft of the mouth inferiorly. Angle of mouth and the inferior part of the snout (before the cleft of the mouth) with many barbels; two pairs of spines above the snout; the keels of the scaly plates prominent, and terminating in spines. The space before the ventrals covered with many polygonal plates. Body with undulated, brownish, transverse lines or spots.

Kamtschatka; west coast of N. America.

a. Very fine specimen. New Orcades (Gulf of Georgia). Presented by the Lords of the Admiralty.
b. Adult: skeleton. New Orcades. Presented by the Lords of the Admiralty.
c. Adult. Vancouver Islands. Presented by the Lords of the Admiralty.

Pseudobranchiæ well developed; three gills and a half without an opening behind the posterior one. The vent is situated before the middle of the belly, immediately behind the base of the ventral fins. The fish feeds on Crustacea.

Skeleton.—The upper surface of the head is rather smooth; there is no occipital crest, but a sharp ridge proceeds from the orbit and runs towards the suprascapula. The space between the orbits is slightly concave, and its width equals the longitudinal diameter of the orbit; there is an acute spine projecting above the posterior angle of the orbit. The præfrontals are distinct, striated, and somewhat elongate, not armed. The turbinal bones are large and long, in immediate contact with each other anteriorly and posteriorly, and leaving a free space between them; they form the projecting part of the snout, where each of them is armed with a pair of spines; another single spine is placed on the posterior part of the bone, close to the spine of the other side. The lateral part of the snout and the cheek are cuirassed by three large and striated infraorbitals: the anterior is elongate, triangular; the second is isoscelous, its upper point being situated below the anterior margin of the orbit; the posterior is the largest, situated between the limbs of the præoperculum and the orbit, the inferior part of which is formed by it. There is a small and narrow postorbital. Each of the three larger bones is armed with a spine situated in one line near the inferior margin of the bones; there is a series of muciferous cavities between the spines and the inferior margin.

The jaw-bones are situated at the lower side of the snout, which projects considerably beyond the mouth. The intermaxillary is short, widening posteriorly; the maxillary is longer, feeble, and becomes a little broader behind; the mandibula has the muciferous channel well developed, and several cavities leading into it. The limbs of the præoperculum are of nearly equal length; two horizontal ridges cross its angle, and the upper one terminates in a spine: the operculum is rather small, triangular, with an elevated ridge.

There are twelve abdominal and twenty-seven caudal *vertebræ*; the hæmal, neural, interhæmal and interneural spines are short and feeble.

3. Agonus dodecaëdrus.

Agonus dodekaëdrus, *Tiles. Mém. Acad. Pétersb.* iv. pl. 13.
Phalangistes loricatus, *Pall. Zoogr.* iii. p. 114.
Aspidophorus dodekaëdrus, *Cuv. & Val.* iv. p. 209.

D. 11 | 7. A. 15.

The height of the body, below the neck, is one-ninth of the total length; the width between the eyes equals their diameter. Two dorsals. Vomerine teeth none (?). No prominent spines above the snout. Præoperculum with three spines, the upper of which is the longest. The lower jaw produced beyond the upper. The keels of the scales terminate in a small point; breast covered with many polygonal, small, convex plates.

Kamtschatka.

4. Agonus rostratus.

Agonus rostratus, *Tiles. Mém. Acad. Pétersb.* iv. pl. 14.
Phalangistes fusiformis, *Pall. Zoogr. Ross.* iii. p. 116.
Aspidophorus rostratus, *Cuv. & Val.* iv. p. 212.

D. 8 | 8. A. 13.

Two dorsals. Vomerine teeth none (?). No prominent spines above the snout; præoperculum with three spines. The lower jaw produced beyond the upper; barbels none. The scales on the back keeled, the keel terminating in a spine; breast covered with many polygonal small plates.

Coast of Kamtschatka; Kurile Islands.

5. Agonus spinosissimus.

Aspidophorus spinosissimus, *Kröyer, Naturhist. Tidsskr.* 1844, i. p. 250.

D. 6 | 7. A. 8.

Jaws equal in length. Head depressed, body compressed. One pair of spines above the snout, a second above the orbits, a third on the nape; the latter is the largest. Tentacles very short and thick. Scales with very prominent spines. Six series of scales between the ventral fins and the vent, four between the vent and the anal fin. Pectoral fins much longer than the head, and equal to one-fourth of the total. Yellowish-brown, marbled with darker.

Greenland.

6. Agonus stegophthalmus.

Cottus japonicus, *Pall. Spicil.* fasc. vii. p. 30. pl. 5; *L. Gm.* i. p. 1213; *Bl. Schn.* p. 105; *Tiles. Mém. Acad. Pétersb.* iv. p. 416, and *Krusenst. Reise*, pl. 87.
Agonus stegophthalmus, *Tiles. l. c.* p. 427. pl. 12, and *Mém. Soc. Natur. Mosc.* ii. p. 219.
Aspidophorus superciliosus, *Cuv. & Val.* iv. p. 215.

D. 6 | 7. A. 8.

The height of the body is one-sixth of the total length. Dorsal fins remote from each other. Vomerine teeth none (?). Above each orbit a flat triangular prominence, directed upwards and outwards; no prominence on the crown; two small spines above the snout. Breast covered with fine granulations. The dorsal spines are strong, enveloped in a thick membrane.

Kuriles.

7. Agonus quadricornis.

Aspidophorus quadricornis, *Cuv. & Val.* iv. p. 221. pl. 80; *Beech. Voy. Zool.* p. 59. pl. 15. f. 1.

D. 9 | 6. A. 10. L. lat. 33.

The height of the body is $3\frac{1}{2}$ in the total length. The dorsals remote from each other. Vomerine teeth none. Barbels none. Two small spines above the snout; two horns above the eyes, and two above the occiput. Space between the eyes nearly equal to their diameter.

Coast of Kamtschatka.

a. Adult. From the Zoological Society's Collection.

b. Adult: bad state. Kamtschatka. Presented by A. Collie, Esq.—Type of the species.

8. Agonus decagonus.

Agonus decagonus, *Bl. Schn.* p. 105. tab. 27.

Aspidophorus decagonus, *Cuv. & Val.* iv. p. 223; *Kröyer, Naturhist. Tidsskr.* 1844, i. p. 243.

D. 6 | 7. A. 8.

Dorsal fins separated from each other by four series of scales. One pair of spines above the snout, a pair of larger ones above the orbits, and a third pair of very large ones before the neck; tentacles few, but long; no groove across the neck. The length of the pectoral equals that of the head, and is one-fifth of the total. Yellowish-brown, marbled with darker.

Greenland.

9. Agonus niger.

Aspidophorus niger, *Kröyer, Naturhist. Tidsskr.* 1844, i. p. 238.

D. 7 | 7. A. 8. L. lat. 36–39.

Dorsal fins separated from each other by two series of scales. Two pairs of spines above the snout, and two above the orbits. Lower jaw with tentacles. A deep groove across the neck. The length of the head is one-fourth of the total, and more than that of the pectorals. (*Kröyer*.)

Valparaiso.

This species appears to be closely allied to the following, if indeed it be not the same

10. Agonus chiloensis.

Aspidophorus chiloensis, *Jenyns, Zool. Beagle, Fishes,* p. 30. pl. 7. f. 1, 1*a*, 1*b*; *Gay, Hist. Chil. Zool.* ii. p. 174.

D. 7 | 8. A. 9. L. lat. 38.

Two dorsals. Vomerine teeth. Angle of the mouth and chin with many barbels. Two pairs of spines above the snout, and two above the orbit. Space between the eyes less than their diameter. Body with brown cross-bars.

Coast of Chile.

a, b. Adult and half-grown. Valparaiso. Purchased of Mr. Bridge.

47. ASPIDOPHOROIDES.

Agonus, sp., *Bl. Schn.* p. 104.
Aspidophoroides, *Lacép.* iii. p. 227.
Aspidophorus, sp., *Cuv. & Val.* iv. p. 224.

Head and body angular, covered with bony plates. Lateral line none. One short dorsal; no pectoral filaments. Teeth in the jaws only.

Coasts of Greenland, reaching southwards to the northern coasts of the United States.

1. Aspidophoroides monopterygius.

Cottus monopterygius, *Bloch,* taf. 178. f. 1, 2; *Gm. L.* i. p. 1213.
Agonus monopterygius, *Bl. Schn.* p. 104.
Aspidophoroides tranquebar, *Lacép.* iii. p. 228.
Aspidophorus monopterygius, *Cuv. & Val.* iv. p. 224, vi. p. 554. pl. 169; *Storer, Rep. Mass.* p. 22. pl. 1. f. 1; *Dekay, New York Fauna, Fishes,* p. 62. pl. 2. f. 6 (5) (bad).
Cottus monopterygius, *Richards. Faun. Bor. Amer. Fishes,* p. 50.
Aspidophoroides grœnlandicus, *Val. in Cuv. Règne Anim. Ill. Poiss.* pl. 21. f. 3.

D. 5. A. 6. L. lat. 47.

Body elongate. One short dorsal. Vomerine teeth none. No barbels. A single pair of spines above the snout; no other spines on the head. Space between the eyes rather less than their diameter. Body with brown cross-bars.

Coast of Greenland.

a. Half-grown. Greenland.
b. Adult.

48. PERISTETHUS.

Peristedion, *Lacép.* iii. p. 368; *Cuv. & Val.* iv. p. 101.
Peristethus, *Kaup, Proc. Zool. Soc.* 1859, p. 103.

Head parallelopiped, with the upper surface and the sides entirely bony; each præorbital prolonged into a long flat process, projecting beyond the snout; body cuirassed with large bony plates. One or two dorsals, the second of which is the more developed; two pectoral appendages. Teeth none; lower jaw with barbels. Air-bladder simple. Pyloric appendages in moderate number.

Mediterranean; tropical parts of the Atlantic; East Indian Seas.

1. Peristethus cataphractum.

Lyra altera, *Rondel.* x. c. 10. p. 299; *Aldrov.* ii. c. 7. p. 147; *Gesner*, p. 517 bis; *Willughby*, p. 283. pl. S. 3; *Ray*, p. 89.
Lyra, *Salv.* f. 192.
Coccyx, *Bellon.* p. 209.
Trigla, sp. 10, *Artedi, Genera*, p. 46; *Gronov. Zoophyl.* no. 282.
Trigla cataphracta, *L. Gm.* i. p. 1341; *Brünn. Pisc. Mass.* p. 72; *Bl.* taf. 349; *Bl. Schn.* p. 16; *Gronov. Syst. ed. Gray*, p. 104; *Martens, Reise nach Venedig*, ii. p. 431.
Cataphractus, sp., *Klein, Miss.* iv. p. 43. no. 4.
Duhamel, Pêches, sect. v. p. 113. pl. 9. f. 2.
Trigla chabrontera, *Osbeck, Nov. Act. Nat. Cur.* iv. p. 201.
—— hamata, *Bl. Schn.* p. 16.
Peristedion malarmat, *Lacép.* iii. p. 369.
—— cataphractum, *Cuv. & Val.* iv. p. 101. pl. 75; *Yarrell, Brit. Fishes*, i. p. 67; *Kaup, Proc. Zool. Soc.* 1859, p. 105. pl. 8. f. 1; *Risso, Hist. Nat.* iii. p. 402; *Cuv. Règne Anim. Ill. Poiss.* pl. 20. f. 3 (not good); *Guichen. Explor. Algér. Poiss.* p. 40.
—— chabrontera, *Lacép.* iii. p. 373; *Risso, l. c.*
Skeleton of the head: *Rosenth. Ichth. Tafeln.* pl. 18. f. 4.

D. 7 | $\frac{1}{19}$. A. 20–21. L. lat. 30. Cæc. pylor. 10. Vert. 10/23.

Præorbital processes elongate, their length being 2$\frac{1}{3}$ in the distance between their extremity and the anterior margin of the orbit. Three small spines on the upper surface of the snout. Each of the bony plates between the base of the ventral fins is twice as long as broad. The ridge of the angle of the præoperculum terminates obtusely. Uniform red.

Mediterranean; British Channel.

a, b. Adult: stuffed. Mediterranean.
c. Adult: stuffed: not good state.
d. Adult. Malta. From the Haslar Collection.
e, f. Fine specimens. Lisbon. Presented by the Rev. R. T. Lowe.
g. Adult. From the Haslar Collection.
h. Adult. From the Haslar Collection
i. Adult. From the Haslar Collection.
k. Adult: skeleton.
l. Adult: not good state. Old Collection.
m. Adult: bad state. Purchased of M. Parzudaki.
n. Cæca pylorica of specimen *h.*

2. Peristethus brevirostre.

D. 7 | 17. A. 19. L. lat. 28.

The length of the præorbital processes is 2$\frac{2}{3}$ to three times in the distance between their extremities and the anterior margin of the orbit. A single pair of spines on the upper surface of the snout.

Each of the bony plates between the ventral fins is twice as long as broad. The ridge of the præoperculum terminates posteriorly in a long spine. Uniform red.

Caribbean Sea.

a. Adult. West Indies. Presented by Sir R. Schomburgk.
b. Adult: stuffed. West Indies. Purchased of Mr. Scrivener.
c. Adult: stuffed.

Description.—The length of the head is one-third of the total; its crown is broad and flat, separated from the broad bony plate, which covers the nape of the neck, by a narrow grooved line, the convexity of which is directed forwards. The space between the orbits is slightly concave, and its width is one-fourth of the length of the head. There is a slight protuberance on the forehead. Each turbinal bone is armed with a prominent triangular spine. The length of the snout is one-half that of the head, and each præorbital process takes one-third of the former; in one of the specimens these processes are a little longer. They are flat, rounded anteriorly, slightly divergent, and covered all over with small granulations, like the whole head. Two ridges arise from the base of the præorbital process, running towards the angle of the præoperculum; the upper one is the stronger, and terminates posteriorly in a depressed spine, which reaches beyond the base of the pectoral. The operculum also has a low ridge, terminating in a prominent spine. All the bones of the head are separated from one another by slightly grooved lines. The jaw-bones are feeble, as usual, and the lower jaw is provided with many barbels, two of which are considerably longer than the others and fringed.

The nape of the neck is cuirassed with a broad bony plate, angularly bent downwards on each side; the abdominal surface with two pairs of large plates. The anterior pair is narrowed between the ventral fins; the greatest width of each plate is one-half of the greatest length. The plates of the posterior pair are rather longer than broad; the vent is situated in a slight notch of their posterior extremity. The space between the vent and the anal is cuirassed with two broad and short plates, undivided in the medial line. Each side of the body and tail is cuirassed with three series of scale-like plates, each armed with a claw-shaped spine, directed backwards; the spines of the lowest series are the strongest. The lower side of the tail has two additional series of spineless plates, separated by the anal fin.

None of the dorsal spines are elongated in any of the specimens; the caudal fin is small, slightly emarginate; the pectoral reaches to the tenth plate of the medial series, the ventral to the origin of the anal.

Coloration uniform red.

	inches.	lines.
Total length	9	2
Length of the head	3	2
Width of the head between the orbits	0	9½
Length of a præorbital process	0	6
Diameter of the eye	0	8½

	inches.	lines.
Greatest length of an anterior ventral plate.	1	3
——— width of an anterior ventral plate.	0	8
——— length of a posterior ventral plate.	0	9
——— width of a posterior ventral plate .	0	8

3. Peristethus laticeps.

Schleg. Bydr. tot de dierk. v. 1852, p. 43, cum tab.

D. 24. A. 17.

The length of the præorbital processes is one-third of the distance of their extremities from the anterior margin of the orbit. Three small spines on the upper surface of the snout. The ridge of the angle of the præoperculum terminates in a spine of moderate length. Uniform red. (*Schleg.*)

Amboyna.

4. Peristethus orientale.

Temm. & Schleg. Faun. Japon. Poiss. p. 37. pl. 14. f. 5, 6, & pl. 14. A. f. 1, 2, and *Bydr. tot de dierk.* v. 1852, p. 44; *Kaup, Proc. Zool. Soc.* 1859, p. 105. pl. 8. f. 2.

D. 28. A. 20.

Præorbital processes divergent, elongate, their length being one-half of the distance between their extremity and the anterior margin of the orbit. No spines on the upper surface of the snout. Each of the bony plates between the ventral fins is three times as long as broad. The ridge of the angle of the præoperculum terminates in a strong spine. A single dorsal fin.

Japanese Sea.

5. Peristethus moluccense.

Valent. iii. p. 363. f. 55; *Renard*, ii. 14. 67.
Peristedion moluccense, *Bleek. Natuurk. Tydschr. Nederl. Ind.* i. p. 24, and *Act. Soc.*
Peristethus gigas, *Kaup, l. c.* p. 106.

D. $7 \mid \frac{1}{16}$. A. 16. L. lat. 26.

Præorbital processes rather elongate, their length being one-third of the distance between their extremity and the anterior margin of the orbit. Three small spines on the upper surface of the snout. Each of the bony plates between the ventral fins is nearly as broad as long. The ridge of the angle of the præoperculum terminates in a strong spine.

Molucca Sea.

a. Fine specimen. Amboyna.

6. Peristethus rieffeli.

Peristethus rieffeli, *Kaup, l. c.* p. 106. pl. 8. f. 3.

D. 6 | 19. A. 17. L. lat. 32.

The length of the præorbital processes is $2\frac{1}{3}$ in the distance of their extremities from the anterior margin of the orbit. A single spine in the middle of the forehead, a pair of obtuse ones above the posterior angle of the orbit, and another pair of larger ones on the posterior extremity of the occipital bones. The anterior ventral plates irregularly shaped, longer than broad. The lateral ridge of the head terminates posteriorly in a very long, flat spine. The upper side of the head, the back, and the rays of the dorsal fins punctulated with brown.

East Indies?

a, b. Have been dried. Probably from Chinese insect-boxes.

Description.—The length of the head is $2\frac{1}{3}$ in the total; the crown is quadrangular, very slightly excavated, each corner being armed with a small spine; it is crossed by a longitudinal and a transverse suture, and separated from the neck by another deeper suture. The space between the orbits is concave, and from one-seventh (probably in females) to one-eighth (probably in males) of the entire length of the head. There is a small triangular spine in front of the eyes, in the middle of the forehead, from which four slight ridges radiate, two towards the space between the eyes, and two towards the snout. The snout is very broad and elongate; its length, without the præorbital processes, equals that of the remainder of the head. The præorbital processes also are elongate, and converge slightly anteriorly*; they are continued posteriorly into a very broad, flat, prominent ridge, which terminates in a long spine. The operculum is armed with two small spines. The diameter of the eye equals the distance between the orbits in one of the specimens, in the other it is rather smaller. I can find only two pairs of barbels at the mandibula.

The nape of the neck s cuirassed with a broad bony plate, angularly bent downwards on each side. I am unable to see distinctly the situation of the vent; but there appear to be *three* pairs of abdominal plates before the vent: the anterior is longer than broad, irregularly formed, anteriorly with an acute process, posteriorly with a small notch; the middle plate is broader than long, provided with a longitudinal ridge and with a small posterior notch, like the former; the posterior is still shorter. Each side of the body and tail is cuirassed with three series of scale-like plates, each of which bears a spine, directed backwards. The spines of the three series are nearly equally developed. The scales of these series are distinguished by their great breadth and small length. *The lateral line is evidently present in this species, and probably in all the others,* its openings being situated behind every spine of the middle lateral series of scales. In this species it commences behind the suprascapula, follows the course of three additional scales intercalated between the dorsal and middle series of scales, is then abruptly bent downwards and is visible through the scales, and finally passes in the direction of the middle series. If an artificial opening be made in it, and a coloured fluid be injected, the course of the muciferous channel, with its branches, becomes very clear, the fluid spreading for a considerable distance by capillary attraction.

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* The strong convergence of the processes in the figure quoted, is merely the result of the posterior part of the præopercles being very much stretched out.

The lower side of the tail has two additional series of plates, separated by the anal fin; each plate has a longitudinal ridge.

None of the dorsal spines are elongate; the caudal fin is small, slightly emarginate; the pectoral reaches to the fifth plate of the dorsal series, the ventral to the third abdominal plate.

Very small round dots are visible on the head, on the back, and on the sides; the spines and rays of the dorsal fins are dotted with brown.

	inches.	lines.
Total length	10	0
Length of the head	4	3
Width of the head between the orbits	0	6½
Entire length of the snout	2	8
Length of the præorbital process	1	2
Diameter of the eye	0	6½
Greatest length of an anterior ventral plate.	1	1
——— width of an anterior ventral plate.	0	9
——— length of the middle ventral plate.	0	7
——— width of the middle ventral plate.	0	8
——— length of a posterior ventral plate.	0	4
——— width of a posterior ventral plate.	0	7

49. DACTYLOPTERUS.

Dactylopterus, *Lacép.* iii. p. 325; *Cuv. & Val.* iv. p. 114.

Head parallelopiped, with the upper surface and the sides entirely bony; scapula and angle of the præoperculum produced into long spines; body with scales, strongly keeled, and of moderate size; lateral line none. Two dorsals, the second not much longer than the first; *pectoral very long (organ for flying), with the lower portion detached and shorter.* Granular teeth in the jaws, none on the palate. Air-bladder divided into two lateral parts, each with a large muscle; pyloric appendages in increased number.

Mediterranean; Atlantic; Indian Ocean and Archipelago.

1. Dactylopterus volitans.

Aristot. iv. c. 9; *Opp.* ii. v. 457–461; *Ælian.* ii. c. 5; *Athen.* vii. p. m. 324; *Bellon.* p. 195; *Rondel.* pp. 284, 285; *Salv.* f. 184; *Willughby,* p. 283; *Parra,* p. 25. pl. 14; *Marcgr. Iter Bras.* p. 162; *Klein, Miss.* iv. pl. 14. f. 1, 2; *Seba,* iii. 28. 7; *Leguat, Voy.* i. pp. 10, 11. f. A & C.

Trigla volitans, *L. Gm.* p. 1346; *Bl.* taf. 351; *Bl. Schn.* p. 12.

—— sp., *Gronov. Zoophyl.* no. 285.

—— tentabunda, *Walbaum, Art. Renov.* iii. p. 362, note.

—— fasciata, *Bl. Schn.* p. 16. tab. 3. f. 1.

Dactylopterus pirapeda, *Lacép.* iii. p. 326.
—— volitans, *Cuv. & Val.* iv. p. 117; *Dekay, New York Fauna, Fishes,* p. 49. pl. 17. f. 46; *Casteln. Anim. nouv. ou rares Amér. Sud, Poiss.* p. 7; *Guichen. Explor. Algér. Poiss.* p. 41.
Polynemus sexradiatus, *Mitch. Trans. Lit. & Phil. Soc. New York,* i. pl. 4. f. 10, and *Am. Monthly Mag.* ii. p. 323.
Dactylopterus communis, *Owen, Osteol. Catal.* i. p. 56.
Gonocephalus macrocephalus, *Gronov. Syst. ed. Gray,* p. 106.

D. 6 | 8. A. 6. Cæc. pylor. 33. Vert. 9/13.

The first two dorsal spines detached from the others. The distance between the eyes is 3¼ to 3½ in the length of the head, and nearly equal to that of the præopercular spine; the distance between the two scapular spines equals the depth of the notch between. Pectorals spotted with light blue; each ray of the second dorsal with four or five brown spots; caudal with bands, formed by spots.

Mediterranean; temperate and tropical parts of the Atlantic.

a. Adult. Mediterranean. Purchased of Mr. Frank.
b. Adult: stuffed. Cape Verde Islands.
c. Adult: skin in spirits. Trinidad. Presented by J. B. Richardson, Esq.
d–g. Adult, half-grown, and young: skins. Jamaica. From Dr. Parnell's Collection.
h. Adult: not good state. Para. Presented by J. P. G. Smith, Esq.
i. Adult. From the Haslar Collection.
k. Adult. From the Haslar Collection.
l. Adult. From the Haslar Collection.
m. Adult.
n. Adult.
o. Adult. From the Collection of the Zoological Society.
p. Half-grown: not good state.
q. Half-grown. From the Haslar Collection.
r. Half-grown.
s–u. Adult: stuffed.
v, w. Half-grown: stuffed.
x. Adult: skeleton. Presented by the Zoological Society.

A full description of the *skeleton* has been given by Cuvier. The anterior tubiform portion of the vertebral column appears to me to be composed of four vertebræ, and the length of the abdominal portion is to that of the caudal as 1 : 1·5.

2. **Dactylopterus orientalis.**

Renard, i. pl. 10. f. 66; *Valent.* iii. f. 35; *Russell,* pl. 161.
Dactylopterus orientalis, *Cuv. & Val.* iv. p. 134. pl. 76; *Richardson, Ichth. Chin.* p. 218; *Bleek. Amb. & Cer.* p. 264; *Temm. & Schleg. Faun. Japon. Poiss.* p. 37. pl. 15 A.
—— orientalis et japonicus, *Bleeker, Japan,* p. 396, and *Verh. Batav. Genootsch.* xxvi. *Japan,* p. 72.

D. 1 | 1 | 5 | 8. A. 6. Cæc. pylor. 19.

A long, isolated, ray-like filament behind the occiput, another shorter one halfway between the former and the dorsal fin; the first dorsal spine detached from the others. The distance between the eyes is one-third the length of the head, and nearly equal to that of the præopercular spine; the distance between the two scapular spines is rather less than the depth of the notch between. Pectorals spotted with brown and dotted with bluish-white.

Indian Ocean and Archipelago.

a. Half-grown: not good state. Japan. Purchased of Mr. Frank.
b. Half-grown. China. Presented by Sir J. Richardson.
c, d. Young. China. Presented by Captain Sir E. Belcher.
e. Half-grown. Amboyna. Purchased of Mr. Frank.
f. Young. Amboyna. Purchased of Mr. Frank.
g. Adult: stuffed. Cape Seas. Presented by Sir A. Smith.
h. Adult: bad state. Old Collection, as *Trigla dissimilis*.
i. Half-grown.
k, l. Young. Presented by the Zoological Society.

3. Dactylopterus macracanthus.

Bleeker, Celebes, vi. p. 449.

D. 1 | 1 | 6 | 8. A. 6.

A long, isolated, ray-like filament behind the occiput; the distance between the two scapular spines is $1\frac{1}{2}$ to $1\frac{3}{5}$ in the depth of the notch between, which equals the length of the præopercular spine; the scapulary spines reach to the vertical from the second spine of the continuous first dorsal fin. Pectoral with a large, round, black blotch, spotted with yellow.

Molucca Sea.

a. Dried: bad state.

4. Dactylopterus chirophthalmus.

Bleeker, Natuurk. Tydschr. Nederl. Ind. 1854, iv. p. 494.

D. 1 | 1 | 6 | 8. A. 6.

A long, isolated, ray-like filament behind the occiput. The distance between the two scapular spines is $1\frac{1}{2}$ to $1\frac{2}{5}$ in the depth of the notch between, which equals the length of the præopercular spine. The scapulary spines reach to the vertical from the middle of the continuous first dorsal fin. Pectoral with a large, round, black, white-edged spot. (*Bl.*)

Sea of Banda-Neira.

50. CEPHALACANTHUS.

Cephalacanthus, *Lacép.* iii. p. 323; *Cuv. & Val.* iv. p. 138.

Head parallelopiped, with the upper surface and the sides entirely bony; scapula and angle of the præoperculum produced into long spines; body with scales, strongly keeled and of moderate size; lateral line none. Two dorsals, the second not much longer than the first; *pectoral rather short, divided into two portions by a deep notch.* Jaws with minute teeth; palate toothless. Air-bladder none; many pyloric appendages.

Tropical parts of the Atlantic.

1. **Cephalacanthus spinarella.**

Pungitius pusillus, *L. Mus. Ad. Fried.* p. 74. pl. 32. f. 5.
Gasterosteus spinarella, *L. Syst. Nat.* i. p. 492; *L. Gm.* i. p. 1327; *Bl. Schn.* p. 124.
Cephalacanthus spinarella, *Lacép.* iii. pp. 323 & 324; *Cuv. & Val.* iv. p. 138: *Cuv. Règne Anim. Ill. Poiss.* pl. 20. f. 4.

D. 6 | 8–9. A. 6–7.

The scapular and præopercular spines are as long as the remainder of the head, and extend nearly as far backwards as the pectorals.

Tropical parts of the Atlantic.

a, b. Adult. Gulf of Guinea.
c–g. Adult. Presented by the Zoological Society.
h. Lat. 20° N., Long. 22° 53′ W. Voyage of H.M.S. Plumper.
i–m. Lat. 2° S., Long. 34° W. From Mr. J. T. Rouse's Collection.
n–p. Adult: not good state.
q, r. Adult: dried.
s. Adult: very bad state. New Orleans.
t–x. Half-grown: not good state.

Fam. 11. TRACHINIDÆ*.

Percoidei, pt., Sciænoidei, pt., et Gobioidei, pt., *Cuv. Règne Anim.*; *Müller, Berl. Abhandl.* 1844.
Uranoscopidæ, pt., Sciænidæ, pt., Gobiidæ, pt., et Blenniidæ, pt., *Richardson.*

Body elongate, low, naked, or covered with scales. Teeth in villiform bands, with pointed and conical canines in some of the genera; no molars or trenchant teeth. The infraorbital ring does not articulate with the præoperculum. One or two dorsal fins, *the spinous portion being always much less developed and shorter than the soft*; *the anal similarly developed as the soft dorsal*; *ventrals with one spine and five rays*†. Gill-opening more or less *wide*; five, six or seven branchiostegals; pseudobranchiæ. No prominent papilla near the anus. Air-bladder generally absent; pyloric appendages in moderate number, or wanting. Vertebræ $\frac{10 \text{ or } 10+x}{14+y}$.

Carnivorous fishes, living at the bottom of the shores of nearly all the seas.

Synopsis of the Groups.

Eyes on the upper surface of the head; lateral line continuous	*a.* **Uranoscopina.**
Eyes more or less lateral; lateral line continuous; no larger tooth on the posterior portion of the intermaxillary	*b.* **Trachinina.**
Eyes lateral; a larger tooth on the posterior portion of the intermaxillary; lateral line continuous	*c.* **Pinguipedina.**
Lateral line interrupted, or not continued to the caudal	*d.* **Pseudochromides.**
APPENDIX	**Heterostichus.**

First Group. URANOSCOPINA.

Eyes on the upper surface of the head; cleft of the mouth vertical; head generally cuirassed with bony plates. Body sometimes naked, sometimes partly or entirely covered with small scales. Lateral line continuous.

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* 1. Pagetodes, *Richards. Voy. Ereb. & Terr. Fishes*, p. 15. pl. 8. f. 3.
2. Hemerocœtes acanthorhynchus, which has been placed by its describer close to fishes of this family, is not an Acanthopterygian fish, all its fin-rays being articulated.

† In *Epicopus* with one spine and six rays.

Synopsis of the Genera.

Two dorsals. Scales very small	1. Uranoscopus.
Two dorsals. Scales none	2. Agnus.
One dorsal. Scales very small. Head cuirassed with bony plates	3. Anema.
One dorsal. Scales none	4. Kathetostoma.
One dorsal. Scales small. Head covered with soft skin ..	5. Leptoscopus.

1. URANOSCOPUS*.

Uranoscopus (*L.*) sp., *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 285.

Head large, broad, partly covered with bony plates; body somewhat cylindrical; cleft of the mouth vertical; eye on the upper side of the head. Scales very small. Two dorsals, the first with three to five spines; ventrals jugular; pectoral rays branched. Villiform teeth in the jaws, on the vomer and the palatine bones, without canines; generally a filament below and before the tongue; opercular apparatus generally armed; cavity of the gills with an opening above the operculum as well as posteriorly. Pseudobranchiæ; six branchiostegals. Air-bladder none; pyloric appendages in moderate number.

East Indian Seas; Polynesia; one species from the Mediterranean.

1. Uranoscopus scaber.

Καλλιώνυμος, *Arist.* ii. c. 15, viii. c. 13; *Ælian.* xiii. c. 4; *Athen.* viii. f. 177.
Οὐρανοσκόπος, *Athen.* vii. f. 142, viii. f. 177.
Ἄγνος, *Athen.* viii. f. 177.
Callionymus, *Plin.* xxxii. c. 7 & 11; *Gesner*, pp. 135, 158; *Willughby*, p. 287.
Uranoscopus, *Plin.* xxxii. c. 7 & 11; *Galien. De usu part.* iii. c. 3; *Rondel.* x. c. 13; *Salv.* f. 196 *b*, 197 *b*, & 198; *Aldrov.* ii. c. 51; *Gesner*, pp. 135, 158; *Willughby*, p. 287; *Ray*, p. 97.
Trachinus, sp. 2, *Artedi, Genera*, p. 42.
Uranoscopus scaber, *L. Syst. Nat.* i. p. 434; *Brünn. Pisc. Mass.* n. 29; *L. Gm.* p. 1156; *Bl.* taf. 163; *Bl. Schn.* p. 46; *Lacép.* ii. p. 349. pl. 11. f. 1; *Risso, Ichth. Nice*, p. 106, and *Eur. Mérid.* iii. p. 261; *De la Roche, Ann. Mus.* xiii. p. 315; *Martens, Reise nach Venedig*, ii. p. 430; *Cuv. & Val.* iii. p. 287; *Richards. Ichth. Chin.* p. 211; *Nordm. in Demid. Voy. Russ. Mérid. Poiss.* p. 371; *Cuv. Règne Anim. Ill. Poiss.* pl. 17. f. 1.
Callionymus araneus, *Gronov. Syst. ed. Gray*, p. 44.
Skeleton: *Rosenth. Ichthyot. Taf.* tab. 18. fig. 5.

D. $4 \,\big|\, \frac{1}{13}$. A. 13–14. Cæc. pylor. 11–12. Vert. 11/15 (10/13 *Cuv.*).

Two dorsals. Scales very small. The length of the head is $3\frac{1}{2}$ in the total; the distance between the gill-openings equals that between the extremities of the occipital and turbinal bones. Humeral spine one-third or one-fourth of the length of the pectoral; suboperculum with one strong spine, præoperculum with four or five smaller ones, all directed downwards. The first dorsal black, the caudal brownish.

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* Uranoscopus marmoratus, *Cuv. & Val.* iii. p. 304.—East Indies.

Mediterranean. [Coast of Pondicherry, cfr. *Cuv. & Val.* iii. p. 303.]

a. Adult. Bay of Naples. Presented by S. P. Pratt, Esq.
b. Adult. Europe.
c. Half-grown. Europe. From the Haslar Collection.
d. Fine specimen. Lanzarote. Presented by the Rev. R. T. Lowe.
e. Adult: skin: not good state. Sine patria. Presented by the Zoological Society.
f. Adult: skin. From Gronow's Collection.
g. Head: dried. From Gronow's Collection.

2. **Uranoscopus occidentalis.**

Agass. in Spix, Pisc. Brasil. p. 123. tab. 73; *Cuv. & Val.* viii. p. 492.

D. 4 | 14. A. 13.

The length of the head is $3\frac{1}{2}$ in the total; the distance between the gill-openings is rather more than that between the extremities of the occipital and turbinal bones. Humeral spine stout, one-third of the length of the pectoral; suboperculum with one, præoperculum with five spines. The first dorsal black.

Atlantic coasts of Tropical America.

a. Adult: stuffed. West Indies.
[? *b, c.* Young. Gulf of Guinea. Congo Expedition.]

3. **Uranoscopus cognatus.**

Cantor, Catal. p. 21.

D. $3 \left| \frac{1}{15} \right.$. A. 14. Cæc. pylor. 8.

The length of the head slightly exceeds one-fourth of the total. Four præopercular spines, placed in two pairs, an anterior and a posterior, with a central space between; the scapular spines small, but distinct; the humeral spine very strong, triangular, and longitudinally furrowed, its length being contained $2\frac{1}{2}$ in that of the pectoral fin. Head above, and back pale brownish-green; cheeks, sides and abdomen silvery, minutely dotted with black; the first dorsal black, near the base clouded with whitish; the second dorsal, caudal, and pectorals minutely dotted with black.

Sea of Pinang.

a. Half-grown: skin. From Dr. Cantor's Collection.—Type of the species.

4. **Uranoscopus affinis.**

Cuv. & Val. iii. p. 304.

D. 5 | 12. A. 13.

The length of the head is $3\frac{1}{2}$ in the total. Humeral spine two-thirds the length of the pectoral; suprascapula with two rather strong spines; præoperculum with six spines. The first dorsal white, with a black spot. (*Cuv.*)

Indian Ocean.

5. Uranoscopus guttatus.

Cuv. & Val. iii. p. 305; *Cuv. Règne Anim. Ill. Poiss.* pl. 17. f. 2.

D. 4 | 12. A. 13. Cæc. pylor. 8.

The anterior part of the sides, above the lateral line, without scales. Præoperculum with six, suprascapula with two spines; humeral spine one-third the length of the pectoral. The posterior margin of the skull with five small, rounded lobes. The head and the back dotted with white; the first dorsal white, with two black spots. (*Cuv.*)

Coast of Pondicherry.

6. Uranoscopus bicinctus.

Temm. & Schleg. Faun. Japon. Poiss. p. 26. pl. 10. B. (not good); *Bleek. Act. Soc. Nederl.* ii. *Amboina*, p. 41.

D. 4 | $\frac{1}{13}$. A. 13.

No barbel below the chin. The length of the head is $3\frac{2}{3}$ in the total; the distance between the gill-openings is rather more than that between the extremities of the occipital and turbinal bones. Suboperculum with one, præoperculum with four spines, pointing downwards*. Body with two dark bands, one across the anterior part of the body, the other below the second dorsal; the first dorsal black, the caudal dark brown.

Japanese and Chinese Seas; Sea of Amboyna.

a. Adult: stuffed. Japan. Purchased of Mr. Frank.
b. Young. China. Presented by Captain Sir E. Belcher, C.B.
c. Young. China. Presented by Captain Sir E. Belcher, C.B.
d. Half-grown: stuffed.

7. Uranoscopus asper.

Temm. & Schleg. Faun. Japon. Poiss. p. 26. pl. 9. f. 1; *Richards. Ichth. Chin.* p. 211.

D. 4 | 14. A. 14.

The length of the head is $4\frac{1}{3}$ in the total; the length of the humeral spine is $2\frac{1}{2}$ in that of the pectoral; two small scapular spines; suboperculum with one, præoperculum with three spines. The first dorsal black; head and back brown, irregularly spotted with lighter.

Chinese and Japanese Seas.

a, *b*. Adult: stuffed. Japan.

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* Bleeker found the number of the præopercular spines to vary between four and six.

8. Uranoscopus sulphureus.

Cuv. & Val. viii. p. 495.

D. 5 | 13. A. 13.

Humeral spine very strong and broad, deeply grooved; suprascapula and infraorbitals without spines; five præopercular spines. (*Val.*)

Friendly Islands.

9. Uranoscopus y-græcum.

Cuv. & Val. iii. p. 308.

D. 4 | 14. A. 13.

The bony plate of the crown is nearly four times as broad as long; from the middle of its anterior margin arises an apophysis, which bifurcates, each branch running towards the orbit; there is a free space, without cuirasse, between the eye, the bony plate of the crown, and the apophysis. Præoperculum, suprascapula, and coracoid without spine. Dorsal spines short and stout.

Caribbean Sea.

a. Adult: stuffed. West Indies.

10. Uranoscopus filibarbis.

Cuv. & Val. iii. p. 307.

D. 4 | 14. A. 13.

Chin with a long and slender barbel. Four præopercular spines. The first dorsal black. (*Cuv.*)

Indian Ocean.

2. AGNUS*.

Uranoscopus, sp., *Cuv. & Val.* viii. p. 493.

Habit and teeth as in *Uranoscopus.* Scales none. Two dorsals, the first with about four spines; ventrals jugular; pectoral rays branched. No filament in the mouth; some bones of the head armed. Six branchiostegals. Air-bladder none.

Atlantic coasts of North America.

1. Agnus anoplus.

Uranoscopus anoplos, *Cuv. & Val.* viii. p. 493; *Dekay, New York Fauna, Fishes,* p. 37. pl. 22. f. 65.

D. 4 | $\frac{1}{13}$. A. 13.

Suborbital ring and præopercular limb very narrow; cheek covered with soft skin; no spines on the præoperculum; humeral spine very small. No filament in the interior of the mandibula. Coloration uniform; fins whitish.

Atlantic coasts of North America.

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* Ἁγνος was one of the denominations given by the Greeks to the Mediterranean species of *Uranoscopus.*

3. ANEMA*.

Uranoscopus, sp., *Cuv. & Val.*

Habit and teeth as in *Uranoscopus*. Scales very small. No filament in the interior of the mouth. One continuous dorsal; ventrals jugular; pectoral rays branched; some bones of the head armed. Six branchiostegals; pseudobranchiæ. Cavity of the gills without superior opening. Air-bladder none; pyloric appendages in moderate number.

East Indian Seas; New Zealand.

1. Anema monopterygium.

Uranoscopus monopterygius, *Bl. Schn.* p. 49.
—— maculatus, *Solander, MSS.*; *Forster, MSS.*; *Richards. Ann. & Mag. Nat. Hist.* 1842, p. 207, and *Ereb. & Terr. Fishes*, p. 54. pl. 33. f. 1–3 †.
—— cirrhosus, *Cuv. & Val.* iii. p. 314.
—— forsteri, *Cuv. & Val.* iii. p. 318.
—— kouripoua, *Less. Voy. Duperrey, Poiss.* pl. 18.

D. 20. A. 17. Cæc. pylor. 14.

No filament in the mouth. Scales extremely small. Cavity of the gills not opened above; a short, obtuse barbel in the middle of the chin. Operculum and præoperculum covered with soft skin. Head, body, and pectoral fins with round or ovate white spots.

New Zealand.

a. Fine specimen. New Zealand. Presented by Sir J. Richardson.
b–d. Adult: very bad state. Bay of Islands. From the Haslar Collection.
e. Adult. From the Haslar Collection.

2. Anema elongatum.

Uranoscopus elongatus, *Temm. & Schleg. Faun. Japon. Poiss.* p. 27. pl. 9. f. 2.

D. 14. A. 18.

The height of the body is $5\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{2}$. Teeth rather large. The bony plates of the skull separated from one another by intervals of soft skin; parts of the operculum and præoperculum naked, bony. The dentary bone with a broad and notched apophysis at its inferior side; præoperculum without spines. Scales very small. Greenish-olive, with numerous dark spots. (*Schleg.*)

Sea of Japan.

3. Anema inerme.

Uranoscopus le beck, *Bloch, Syst.* p. 47.
—— inermis, *Cuv. & Val.* iii. p. 310. pl. 65; *Cuv. Règne Anim. Ill. Poiss.* pl. 17. f. 3; *Faun. Japon. Poiss.* p. 27. pl. 10 *a*.

D. $\frac{4}{16-18}$. A. 16–19. Cæc. pylor. 8.

One dorsal. Scales very small. The length of the head is $3\frac{1}{2}$ in the total; the posterior margin of the occipitals straight, without notch; operculum and præoperculum naked, bony; sub- and præoperculum without spines; spine of the shoulder small. Cavity of the gills not opened above. Back, dorsal and pectoral fins with large round or ovate white spots.

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* From νῆμα, filament, and the ἀ privativum. † Barbel much too long.

East Indian Seas.

a. Adult: stuffed. Ceylon. From the Collection of the Zoological Society.
b. Half-grown. Madras. Presented by T. C. Jerdon, Esq.
c. Adult: stuffed.

4. KATHETOSTOMA*.

Uranoscopus, sp., *Cuv. & Val.* iii. p. 319.

Habit and teeth as in *Uranoscopus.* Scales none. One continuous dorsal; ventrals jugular; pectoral rays branched; some bones of the head armed. Cavity of the gills without superior opening; six branchiostegals; pseudobranchiæ. Air-bladder none.

Australian Seas.

1. Kathetostoma læve.

Uranoscopus lævis, *Bl. Schn.* p. 47. tab. 8; *Cuv. & Val.* iii. p. 319.

D. 17. A. 17.

One dorsal. Scales none. The length of the head is $3\frac{2}{3}$ in the total. Three spines on the inferior margin of the præoperculum, two below the mandibula, two on the throat.

Australian Seas.

a. Adult Port Arthur. From the Haslar Collection.
b. Twenty-six inches long and seven broad: stuffed. Australia. Presented by Captain Stokes.

5. LEPTOSCOPUS.

Leptoscopus, *Gill, Proc. Ac. Nat. Sc. Philad.* 1859, p. 133.
Uranoscopus, sp., *Richards. Voy. Ereb. & Terr. Ichthyol.* p. 55.

Form of the head as in *Uranoscopus,* but entirely covered with soft skin; body elongate; cleft of the mouth approaching the vertical line; eye on the upper side of the head. Scales small, cycloid. One continuous dorsal; ventrals jugular; pectoral rays branched. Villiform teeth in both the jaws, on the vomer and the palatine bones; without canines. No interior or exterior filament; opercles without external spines. Cavity of the gills very wide, partially opened above. Six branchiostegals; pseudobranchiæ. Neither an air-bladder nor pyloric appendages.

Port Jackson.

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* From κάθετος, vertical, and στομα, mouth.

1. Leptoscopus macropygus.

Uranoscopus macropygos, *Richards. Voy. Ereb. & Terr. Ichthyol.* p. 55. pl. 33. f. 4–6.
Leptoscopus macropygus, *Gill, l. c.*

D. 31. A. 36. L. lat. 86 (43).

The scales of the lateral line twice as large as those of the adjoining series, each corresponding to two transverse series. The upper half of the head and body olive, mottled with brown; lateral line brown.

Port Jackson.

a. Fine specimen, and type of the species. From the Haslar Collection.

Second Group. TRACHININA[†].

Eyes more or less lateral. Head not cuirassed. Lateral line continuous. Intermaxillary without larger tooth on its posterior portion.

Synopsis of the Genera.

* Body with scales.

Cleft of the mouth very oblique, wide. Two dorsals; ventrals jugular. Palatine teeth	6. Trachinus.
One dorsal, more or less continuous; ventrals a little before the pectorals. Canine teeth in the jaws; no palatine teeth	7. Percis.
Cleft of the mouth slightly oblique. Two dorsals; ventrals jugular, with one spine and five soft rays. Vomerine teeth	8. Aphritis.
Muciferous system of the head well developed. Ventrals thoracic. No palatine teeth	9. Sillago.
Two dorsals; ventrals jugular; no teeth at all on the palate	10. Eleginus.
Ventral with one spine and six soft rays; teeth cardiform	11. Epicopus.
Cleft of the mouth horizontal, with the lower jaw very prominent. Two dorsals; ventrals jugular. Palatine teeth; canines very strong	12. Percophis.

** Body without scales.

Snout very large, spatuliform	13. Chænichthys.
Snout short; bones of the head without externally visible armature	14. Bovichthys.
Snout short. Præorbital and præoperculum armed	15. Trichodon.

[†] Homalopomus trowbridgii, *Girard, Proc. Acad. Nat. Sc. Philad.*, appears to belong to this group.—Western coasts of the United States.

6. TRACHINUS.

Trachinus, (*Artedi*) *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 233.

Body cylindrical, elongate; cleft of the mouth very oblique; eye lateral, directed upwards. Scales very small, cycloid. Two dorsals, the first short, with six or seven spines; ventrals jugular; the lower pectoral rays simple. Villiform teeth in the jaws, on the vomer, the palatine and pterygoid bones. Præorbital and operculum armed. Six branchiostegals; pseudobranchiæ. Air-bladder none; pyloric appendages in small number.

Mediterranean; eastern shores of the Atlantic; coast of Chile.

1. Trachinus draco.

Δράκων, *Aristot.* viii. c. 13; *Ælian.* ii. c. 50.
Araneus, *Plin.* ix. c. 48.
Draco marinus, *Plin.* ix. c. 27, xxxii. c. 11; *Salv.* f. 71.
Draco, *Rondel.* x. c. 11; *Aldrov.* ii. c. 50; *Willughby*, p. 288; *Ray*, p. 91.
Trachinus, no. 1, *Artedi, Genera*, p. 42; *Gronov. Zoophyl.* no. 274.
—— draco, *L. Syst. Nat.* i. p. 435; *Brünn. Pisc. Mass.* no. 30; *Risso, Ichth. Nice*, p. 108, and *Eur. Mérid.* iii. p. 260; *De la Roche, Ann. Mus.* xiii. p. 331; *Martens, Reise nach Venedig*, ii. p. 429; *Cuv. & Val.* iii. p. 238; *Yarr. Brit. Fishes*, i. p. 24; *Fries och Ekstr. Skand. Fisk.* p. 13. t. 3. f. 1; *Nordm. in Demid. Voy. Russ. Mérid. Poiss.* p. 370; *Gronov. Syst. ed. Gray*, p. 46.
Duhamel, Pêches, ii. p. 235.
Trachinus lineatus, *Bl. Schn.* p. 55. tab. 10.
—— major, *Don. Brit. Fishes*, v. pl. 107.

D. 6 | 29–31. A. 30–34. Cæc. pylor. 6. Vert. 11/31 (10/30 *Cuv.*).

Two small spines above the anterior angle of the orbit. Præorbital with a more or less obtuse anterior point. The height of the body is contained 5½ or 6 in the total length. The spinous dorsal black.

Coasts of Europe; Mediterranean; western coasts of Africa.

a. Large specimen. North coast of Norway. From Mr. Brandt's Collection.
b–e. Large specimens: stuffed. England.
f, g. Large specimens. English coast.
h. Large specimen: skin. South Devon. From Mr. Yarrell's Collection.
i. Large specimen: skin. Plymouth. From Mr. Yarrell's Collection.
k. Large specimen: stuffed. Frith of Forth.
l, m. Adult. Mediterranean. From Mr. Frank's Collection.
n. Adult. Bay of Naples. Presented by S. P. Pratt, Esq.
o. Adult. Bay of Naples. Presented by S. P. Pratt, Esq.
p. Large specimen. Atlantic Ocean. From Mr. Frank's Collection.
q. Adult. Madeira. Presented by Lady Franklin.
r. Fine specimen. Gomara. Presented by the Rev. R. T. Lowe.

s. Adult. Lanzarote. Presented by the Rev. R. T. Lowe.
t. Adult. Europe. Presented by the Zoological Society.
u, v. Large specimens: skins. Europe. From Mr. Yarrell's Collection.
w. Large specimen. Europe. From the Haslar Collection.
x. Large specimen: skeleton. Europe.
y. Half-grown: skin. From Mr. Yarrell's Collection.
z. ? Adult: bad state. Coast of Guinea. From Mr. Frank's Collection as *Trachinus armatus.*
α. Large specimen: stuffed: bad state. Cape Seas. Presented by Sir A. Smith.
β, γ. Large specimens: skins. Sine patria.
δ. Adult: skin. From Gronow's Collection.

In the specimens *r*, *s*, and *z*, the spines of the præfrontal and præorbital are rather pointed, and more distinct than in the others. I do not think this peculiarity sufficient to regard those specimens as forming a separate species, and the following description will show how closely allied they are to the specimens from more northern coasts.

The height of the body is $5\frac{1}{2}$ in the total length, the length of the head $4\frac{2}{3}$. The cleft of the mouth is very oblique, wide, the upper maxillary reaching beyond the vertical from the posterior margin of the orbit. The snout is obtuse, and shorter than the eye, armed with two spines, pointing forwards. There is a pair of spines above the anterior angle of each orbit; the anterior spine is the strongest. The space between the orbits is very narrow and concave. The eye interferes with the upper profile of the head, and its diameter is nearly one-fifth of the length of the head. The upper surface of the head, behind the orbits, the scapulary, and the infraorbital ring are granulated. The præoperculum is armed with four flat spines: two at its lower limb, the anterior of which points forward; the third at, and the fourth above, the angle. The operculum has a very long and strong spine; suprascapula minutely serrated.

The distance between the spinous dorsal and the occiput is less than the length of the first spine; the second and third spines are the longest, one-third of the length of the head, and equal to the height of the soft dorsal. The caudal is subtruncated. The rays of the anal are stouter and shorter than those of the dorsal. The pectoral reaches to the vertical from the sixth anal ray. The ventral is inserted below the anterior angle of the suboperculum, and does not extend to the origin of the anal.

	inches.	lines.
Total length	7	0
Height of the body	1	3
Length of the head	1	6
Diameter of the eye	0	$3\frac{3}{4}$
Length of the third dorsal spine	0	6

Skeleton.—The maxillary and intermaxillary are of nearly equal length; the former becomes gradually wider towards the posterior extremity, which is truncated. The hind margin of the latter is flat and transparent; its posterior process is of moderate length. The mandibula has no distinct muciferous channel or pores, and the space between the articular and dentary bones is nearly entirely closed. The two præopercular limbs meet at a right angle, the inferior being shorter than the posterior; the interior ridge of the bone is slightly elevated, without a distinct muciferous channel; there is a free process at the upper extremity of the posterior limb, pointing forwards towards the infraorbital ring. The operculum is armed with a strong, straight spine; the sub- and interoperculum have a membranaceous margin. There are neither ridges nor grooves on the upper surface of the head; the crown is broad, and slightly rounded on the sides; the space between the orbits is narrow and somewhat concave; the præfrontal is armed with two or three small spines. The infraorbital ring is narrow, but solid, all the bones being of nearly equal width, and firmly grown together.

The suprascapula is firmly joined to the skull, and has, like the scapula, the upper margin finely serrated. The humeral has a very feeble process for the junction with the scapula; the axis of the remainder of the bone is straight, and situated in an oblique direction. The ulna is joined to the humerus by two processes, which have a wide opening between them; there is a second opening between the upper process and the radius.

There are eleven abdominal and thirty-one caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 3·6; the vertebræ are moderately long and broad; the ribs, the neural, hæmal, interneural and interhæmal spines are feeble; the anterior interhæmals are composed of three distinct lamellæ; those of the first four anal rays have the same situation as in *Tr. vipera* and *araneus.*

2. Trachinus araneus.

Draco major, *Salv.* fol. 71; *Willughby,* tab. S. 10. f. 1, 2.
Araneus tertius, *Aldrov.* p. 259.
Aranei species altera, *Willughby,* p. 289.
Trachinus lineatus, *Risso, Ichth. Nice,* p. 109, and *Eur. Mérid.* iii. p. 260 (not *Schneid.* nor *De la Roche*).
—— araneus, *Cuv. & Val.* iii. p. 248; *Martens, Reise nach Venedig,* ii. p. 430.
Skeleton: *Agass. Poiss. Foss.* iv. p. 195. pl. E.

D. 7 | 28. A. 31. Vert. 10/29.

Two small spines above the anterior angle of the orbit. Præorbital with an obtuse anterior point. The height of the body is 5⅓ in the total length. Six or seven black blotches on the sides below the lateral line; the spinous dorsal black.

Mediterranean.

a. Half-grown: skin. Sine patria. From Mr. Yarrell's Collection.

3. Trachinus radiatus.

Trachinus lineatus, *De la Roche, Ann. Mus.* xiii. pp. 331, 332 (not *Schneid.* nor *Risso*).
—— radiatus, *Cuv. & Val.* iii. p. 250. pl. 61.

D. 6 | 25. A. 27. Cæc. pylor. 6.

Two anterior spines of the præorbital and the spines above the orbit very distinct. The height of the body is less than one-fifth of the total length. The upper surface of the skull and the infraorbital ring with granulations radiating from distinct centres. The spinous dorsal black. (*Cuv.*)

Mediterranean.

4. Trachinus vipera.

Willughby, i. p. 289; *Ray*, p. 92; *Duhamel, Pêches*, ii. p. 135. pl. 1. f. 2.
Trachinus, var., *Gronov. Mus. Ichth.* i. p. 42.
—— draco, *Bl.* taf. 61 (very bad); *Bl. Schn.* p. 55.
Common Weever, *Penn. Brit. Zool.* iii. p. 226. pl. 32.
Trachinus vipera, *Cuv. & Val.* iii. p. 254; *Parn. Fishes Frith of Forth*, p. 12; *Yarr. Brit. Fishes*, i. p. 29; *White, Catal. Brit. Fishes*, p. 13; *Cuv. Règne Anim. Ill. Poiss.* pl. 15. f. 1; *Guichen. Explor. Sc. Algér. Poiss.* p. 36.
—— horridus, *Gronov. Syst. ed. Gray*, p. 46.

D. 6 | 21–23. A. 26. Cæc. pylor. 6. Vert. 10/25.

Five simple pectoral rays. No spines above the orbit. The height of the body is one-fifth of the total length. The spinous dorsal black.

Coasts of France, Great Britain, and Holland; Mediterranean.

a. Fine female specimen. Brighton. Presented by Mr. E. Gerrard.
b, c. Adult. Lincolnshire. Presented by Sir J. Richardson.
d. Adult: skin. South Devon. From Mr. Yarrell's Collection.
e–g. Adult: stuffed. England.
h, i.? [Adult: very bad state. Seychelles. From the Haslar Collection.]
k. Adult. Sine patria.
l. Adult. Sine patria. Museum Leach.
m. Adult. Sine patria.
n. Adult: skin. From Gronow's Collection.
o. Adult: stuffed. England. From Mr. Yarrell's Collection.
p. Adult: skeleton.

Skeleton.—The maxillary becomes gradually wider towards the posterior extremity, which is truncated: the intermaxillary is much shorter, and has a flat prominence behind; its posterior process is of moderate length. The mandibula has no distinct muciferous channel. The limbs of the præoperculum meet at a right angle, and the lower is much shorter than the posterior; there are two slender spines at the inferior side of the angle. The operculum is armed with a strong, straight spine. The infraorbital ring is narrow*, but solid, all the bones being of nearly equal width, and firmly grown together. The frontal bones are very narrow between the orbits, and have the margin raised above the level of the crown. The crown is rather flat, without ridges or grooves; the basal portion of the cranium is slightly swollen on each side.

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* Sir J. Richardson (*Ichthyol. Ereb. & Terr.* p. 61) describes a structure of the infraorbital bones, in this species, similar to that in the *Triglidæ*; but it is evident that he has examined the skeleton of a fish different from *Tr. vipera*.

There are ten abdominal and twenty-five caudal *vertebræ*, the former portion of the vertebral column being to that of the caudal as 1 : 2·6. The vertebræ are rather short, compressed; the ribs, neural, hæmal, interneural and interhæmal spines are feeble. The five anterior anal rays are situated below the abdominal cavity, and their interhæmals, therefore, are much inclined backwards, thus acquiring a point of attachment at the hæmals of the anterior caudal vertebræ; the interhæmal of the sixth anal ray has the usual vertical direction.

5. Trachinus cornutus.

Gay, Chile, ii. p. 162.

D. 7 | 25. A. 28.

Præoperculum with four strong spines beneath; on each side, before the eye, a rather long recurved spine. Uniform grey; first dorsal black-edged.

Coast of Chile.

7. PERCIS*.

Percis, *Bl. Schn.* p. 179; *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 259.

Body cylindrical, elongate; cleft of the mouth slightly oblique; eye lateral, directed upwards. Scales small, ctenoid. Dorsals more or less contiguous, the spinous with five (four) spines; ventrals a little before the pectorals; the lower pectoral rays branched. Villiform teeth in the jaws, with the addition of canines; teeth on the vomer, none on the palatines. Operculum with two small spines; præoperculum entire or slightly denticulated. Six branchiostegals; pseudobranchiæ. Air-bladder none; pyloric appendages in small number.

From the Red Sea to the coasts of Australia and Polynesia.

A. *The middle dorsal spines the longest.*

1. Percis nebulosa.

? Percis maculata, *Bl. Schn.* p. 179. tab. 38.
Percis nebulosa, *Quoy & Gaim. Voy. Freyc. Poiss.* p. 349; *Cuv. & Val.* iii. p. 260.
—— emeryana, *Richards. Ann. & Mag. Nat. Hist.* 1842, ix. p. 130, *Icon. Pisc.* tab. 1. f. 1, and *Ichth. Chin.* p. 211.

D. 5 | 21–22. A. 19–20. L. lat. 85. Cæc. pylor. 4.
Vert. 10/20.

The height of the body is $5\frac{1}{2}$ in the total length, the length of the head about four times. The interspace between the eyes is more than the length of their diameter. On each side are two rows of brown clouded spots, those above the lateral line being the larger; the spinous dorsal is deep black, with a vertical white streak before the third spine, and a small white spot posteriorly,—the second either white with four series of brown spots, or brown with as many series of white spots; caudal with indistinct whitish transverse lines.

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* 1. *Renard,* i. 6. 42; Percis ocellata, *C. & V.* iii. p. 270.—East Indies.

Cuvier considers as a variety a similar fish with the spinous dorsal entirely black and with the soft greyish, with transparent spots. Body greyish-brown, clouded with darker.

Ile de France; Sharks' Bay (New Holland); Depuch Island.

Var. Ventrals black.

a. Adult: stuffed. Voyage of H.M.S. Herald.

This specimen corresponds with Sir J. Richardson's description of *P. emeryana,* but has the ventrals black.

Old age? New species? Both lobes of the caudal produced into filaments, as long as the fin.

b. 8½ inches long. Discoloured. Presented by J. B. Jukes, Esq.

This specimen has the form and the coloration of the head of *P. emeryana,* as it is figured by Sir J. Richardson, but is distinguished by the elongate caudal lobes.

2. Percis punctata.

Cuv. & Val. iii. p. 264.

D. 5 | 21. A. 19. L. lat. 60.

A single row of black spots above the lateral line; two or three series of spots across the neck. The spinous dorsal transparent, the soft with three series of darker specks; caudal with six or seven brownish cross-streaks. (*Cuv.*)

Hab. —— ?

3. Percis punctulata.

Cuv. & Val. iii. p. 265; *Less. Voy. Coq. Zool. Poiss.* p. 219.

D. 5 | 21. A. 17. L. lat. 60.

The ventrals reach to the vent. Præoperculum entire. Reddish-grey: snout with round whitish spots, edged with brown; across the back six or seven light-brown bands, and on each side of the dorsal three series of black specks; neck spotted with brown; on each side of the tail and belly ten or twelve large brown blotches; the spinous dorsal black, with the upper margin white, the soft with three series of brown spots; caudal truncated, with three blackish specks in each interval between two rays, and nearer to the posterior margin than to the base of the fin; anal with six black spots along the base, and with a black speck on each interval between the rays, near the margin of the fin.

Ile de France.

a, b. Fine specimens. From the Haslar Collection.

4. Percis hexophthalma.

Percis hexophtalma, (*Ehrenb.*) *Cuv. & Val.* iii. p. 271, vii. p. 507.
—— polyophtalma, (*Ehrenb.*) *Cuv. & Val.* iii. p. 272.
—— cylindrica, *Rüpp. Atlas Fische*, p. 19. t. 5. f. 2 (not *Cuv.*).
—— caudimaculata, *Rüpp. Neue Wirbelth. Fische*, p. 98; *Bleeker, Perc.* p. 54, and *Celebes*, iv. p. 11.

D. 5 | 19. A. 18. L. lat. 62. L. transv. 7/19.

The height of the body is seven times in the total length, the length of the head 4⅓. The distance between the eyes is one-third of the length of the snout. The ventrals reach to, or nearly to, the origin of the anal fin. A large black central blotch on the caudal; along each side of the belly three or more white rings with black centre. The spinous dorsal with a black basal spot; the soft dorsal with three longitudinal series of black spots, the anal with one.

From the Red Sea to the Louisiade Archipelago.

a. Adult. Sine patria. From Mr. Frank's Collection.
b. Adult: stuffed. Sine patria.
c. Adult: stuffed. Louisiade Archipelago. Voyage of the 'Rattlesnake.'
d. Adult. Red Sea.
e. Adult. Old Collection.

Rüppell says that this species has no pyloric appendages.

5. Percis cylindrica.

Seba, iii. 27. 16.
Sciæna cylindrica, *Bloch*, taf. 299. f. 1; *Lacép.* iv. p. 314.
Bodianus sebæ, *Bl. Schn.* p. 335.
Percis cylindrica, *Cuv. & Val.* iii. p. 267; *Bleek. Banda*, i. p. 235 (not *Rüpp.*).

D. 5 | 21. A. 18. L. lat. 50.

The height of the body is 5⅓ to 6½ in the total length, the length of the head 4⅓ to 4⅔. Ventral fins rather elongate, reaching to the fifth anal ray; the third and fourth dorsal spines rather longer than the intermaxillary. Body with nine or ten cross-bands; a brown band from the eye to the throat; interoperculum spotted with yellow and brown; the spinous dorsal blackish, the soft dorsal and anal spotted with whitish and brown, the caudal with black.

Molucca Sea; Chinese Sea.

a, b. Adult and half-grown. Amboyna. From Mr. Frank's Collection.
c. Adult. Philippines.
d. Adult. China Seas. Presented by Captain Sir E. Belcher, C.B.
e. Adult. Sir Charles Hardy's Island. Presented by J. B. Jukes, Esq.
f. Adult. From the Haslar Collection.
g. Young.

6. Percis xanthozona.

Bleeker, Perc. p. 55.

D. 5 | 21. A. 18. L. lat. 65.

The height of the body is one-seventh of the total length, the length of the head one-fourth. Præoperculum entire; caudal rounded. Greenish-brown, with nine or ten brownish cross-bands, and with a broad yellow longitudinal band; opercles striated and dotted with blue; the spinous dorsal brown, the soft dorsal with three, the anal with one longitudinal series of black spots; caudal with a large yellow blotch and several black dots. (*Bl.*)

Sea of Batavia.

7. Percis pulchella.

Temm. & Schleg. Faun. Japon. Poiss. p. 24. pl. 10. f. 2; *Richards. Ichth. Jap. & Chin.* p. 211

D. 5 | 21. A. 18. L. lat. 62. L. transv. 6/18.

The height of the body is six times in the total length, the length of the head $4\frac{1}{2}$; the distance between the eyes is small, and one-half the length of the snout; the ventrals do not reach to the origin of the anal. Purplish-brown, with six darker cross-bars, interrupted by a yellowish longitudinal band; head with light-blue lines; the spinous dorsal brownish at the base, the soft yellowish, with three series of yellow specks. Caudal and anal spotted with light blue, the latter with a broad dark-brown margin.

Sea of Japan.

a. Adult. Japan.
b. Skin: in spirits. Japan. From the Leyden Museum.
c. Adult. From the Haslar Collection.

8. Percis cancellata.

Labrus tetracanthus, *Lacép.* iii. pp. 473, 488, ii. pl. 13. f. 3.
Percis cancellata, *Cuv. & Val.* iii. p. 268; *Bleek. Batj.* iii. p. 501.

D. 5 | 21. A. $\frac{1}{16}$. L. lat. 62 L. transv. 9/18.

The height of the body is $6\frac{3}{4}$ in the total length, the length of the head $4\frac{1}{4}$; the distance between the eyes is one-half the length of the snout. The ventral fins reach nearly to the origin of the anal; the length of the fourth dorsal spine is much less than that of the intermaxillary. Brown, with three series of light blotches, each with darker centre: the first series along the base of the dorsal; the second along the middle of the body, alternating with the former; the third corresponding to the second, across the belly, each blotch oblong and continuous with that of the other side, white-edged; a round black spot on the suprascapula; a large and broad brown blotch below the eye: the spinous dorsal transparent, clouded with brownish; the soft dorsal with three series of brown specks; caudal spotted with brown, each spot with black centre; anal black-edged: ventral colourless.

East Indian and Louisiade Archipelago.

a. Adult: stuffed. Louisiade Archipelago. Voyage of H.M.S. Rattlesnake.
b. Adult. Amboyna. From Mr. Frank's Collection.

9. **Percis tetracanthus.**

? Bodianus tetracanthus, *Lacép.* iv. pp. 285, 302.
Percis tetracanthus, *Bleek. Batav.* p. 458.

D. 4 | 21. A. 18. L. lat. 65.

The height of the body is eight times in the total length, the length of the head $4\frac{1}{4}$; the distance between the eyes is one-third the length of the snout; the ventral fins reach slightly beyond the origin of the anal. Coloration similar to that of *P. cancellata*; caudal dotted with brown, and with a large white blotch on its posterior half; ventrals yellowish.

Seas of Java, Amboyna, and of the Feejee Islands.

a. Half-grown. Amboyna. Purchased of Mr. Frank.
b, *c*. Adult and half-grown. Feejee Islands. Voyage of the 'Herald.'

10. **Percis millepunctata.**

D. 4 | 21. A. 18. L. lat. 62. L. transv. 4/8.

The height of the body is $7\frac{2}{3}$ in the total length, the length of the head four times. The width of the interorbital space is one-fourth of the length of the snout. The second and third dorsal spines are the longest, much shorter than the intermaxillary bone; the ventrals reach to the vent. Body with many blackish dots, not banded; snout and lips blackish.

Coast of Ceylon.

a. Eighty lines long: not good state. Ceylon. From the Collection of Messrs. von Schlagintweit.

B. *The posterior dorsal spines equal to, or longer than, the middle ones.*

11. **Percis sexfasciata.**

Temm. & Schleg. Faun. Japon. Poiss. p. 25.

D. $\frac{5}{23}$. A. 21. L. lat. 67.

The distance between the eyes is one-half of their diameter. The ventrals reach to the vent; the four posterior dorsal spines of equal length, and half the height of the soft dorsal. Præoperculum with three small spines at the angle. On each side are six vertical brown bands, bifurcated above, each being composed of three spots, the inferior of which is single, and double the size of the upper ones. A dark spot on the upper angle of the root of the caudal; the soft dorsal with eight blackish spots along the base; ventrals brownish. (*Schleg.*)

Sea of Japan.

12. Percis semifasciata.

Cuv. & Val. iii. p. 276. pl. 62.

D. $\frac{5}{26}$. A. 24.

Back brown, dotted with darker, and with six darker cross-bars; the soft dorsal with a series of brown spots. (*Cuv.*)

Hab. —— ?

13. Percis nycthemera.

Cuv. & Val. iii. p. 274; *Less. Voy. Coq. Zool. Poiss.* p. 218; *Cuv. Règne Anim. Ill. Poiss.* pl. 15. f. 2.

D. $\frac{5}{20}$. A. 17. Cæc. pylor. 4.

The interspace between the eyes is one-half longer than their diameter. The fifth dorsal spine is the longest. Above brown, beneath whitish; five series of brown spots on the soft dorsal; the spinous portion entirely brown. (*Cuv.*)

New Zealand.

14. Percis colias.

Gadus colias, *Forster.*
Enchelyopus colias, *Bl. Schn.* p. 54.
Percis colias, *Cuv. & Val.* iii. p. 273.

D. $\frac{5}{25}$. A. 18. (*Forst.*)

Back and fins blackish-blue, belly whitish; operculum and the posterior part of the dorsal black-spotted.

New Zealand.

8. APHRITIS.

Cuv. & Val. viii. p. 483.

Cylindrical, elongate; cleft of the mouth slightly oblique, with the lower jaw rather longer; eye lateral. Scales rather small, minutely ciliated. Two separate dorsals, [the first with six spines]; ventrals jugular, with one spine and five soft rays; the lower pectoral rays branched. Villiform teeth in the jaws, on the vomer [and the palatine bones], without canines. Operculum with a flat point, præoperculum entire. Six branchiostegals. Air-bladder none; pyloric appendages in small number.

Fresh waters of Van Diemen's Land. [Western coasts of South America.]

1. Aphritis urvillii.

Cuv. & Val. viii. p. 484. pl. 243.

D. 6 | 19. A. 25. L. lat. 65. Cæc. pylor. 4.

Palatine teeth. Caudal truncated. Reddish, marbled with brownish; dorsal and caudal fins with series of red dots. (*Val.*)

Fresh waters of Van Diemen's Land.

The two following species appear to form another genus:—

2. Aphritis undulatus.

Jenyns, Zool. Beagle, Fishes, p. 160. pl. 29. f. 1; *Gay, Hist. Chil. Zool.* ii. p. 168.

B. 6. D 7–8 | 24–25. A. 23.

Palatine teeth none; the upper jaw longest. The height of the body is about six times in the total length, the length of the head 4½. Olivaceous, irregularly spotted with brownish. (*Jen.*)

Chonos Archipelago (west coast of South America).

3. Aphritis porosus.

Jenyns, l. c. p. 162.

D. 8 | 25. A. 23.

Palatine teeth none; the upper jaw longest. The height of the body is about one-sixth of the total length, the length of the head one-fourth. Olivaceous-brown, with six or seven indistinct dusky cross-bars. (*Jen.*)

Coast of Patagonia.

9. SILLAGO*.

Sillago, *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 398.

Body somewhat cylindrical, elongate; cleft of the mouth small, with the upper jaw rather longer; eye lateral, somewhat directed upwards. Scales rather small, ctenoid. Two dorsals, the first with nine to twelve spines; ventrals thoracic; the lower pectoral rays branched. Villiform teeth in the jaws and on the vomer, none on the palatines. Operculum terminating in a point, præoperculum denticulated. The bones of the head with the muciferous system developed†. Six branchiostegals; pseudobranchiæ. Air-bladder simple; pyloric appendages in small number.

From the Red Sea to the southern coasts of Australia.

1. Sillago sihama.

Atherina sihama, *Forsk.* p. 70.
Sciæna malabarica, *Bl. Schn.* p. 81. t. 19.
Platycephalus sihamus, *Bl. Schn.* p. 60.
Russell, t. 113.
Sillago sihama, *Rüpp. Atl. Fische,* p. 9. taf. 3. f. 1.
—— acuta, *Cuv. & Val.* iii. p. 400; *Bleeker, Perc.* p. 61.

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* 1. Sillago burrus, *Richards. Ann. & Mag. Nat. Hist.* 1842, ix. p. 128, and *Icon. Pisc.* pl. 2. f. 1.—Australia.

† The physiognomy of the fishes of this genus has a striking similarity to *Pachyurus,* a Sciænoid genus.

Sillago erythræa, *Cuv. & Val.* iii. p. 409.
—— malabarica, *Cant. Catal.* p. 21; *Bleek. Bali*, iii. p. 157.

D. 11 | $\frac{1}{20}$. A. $\frac{1}{22-23}$. L. lat. 70. L. transv. 4/11. Cæc. pylor. 2*. Vert. 14/20.

The height of the body is one-sixth of the total length, the length of the head one-fourth. The space between the eyes is one-half the length of the snout. The ventral spine feeble. Coloration uniform brownish-yellow, with a silvery lateral streak; fins transparent, reddish-violet.

From the Red Sea through all the Indian Seas.

a. Adult: stuffed. Red Sea.
b. Half-grown: not good state. Ceylon. From the Collection of the Zoological Society.
c. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.
d. Adult. Amboyna. From Mr. Frank's Collection.
e. Adult. Amboyna. From Mr. Frank's Collection.
f. Adult. Philippines.
g. Half-grown. Canton. Presented by the Zoological Society.
h, i. Adult and half-grown. China. Presented by J. R. Reeves, Esq.
k. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
l. Adult: skeleton. China.
m. Half-grown. China.
n. Young: bad state. China. Presented by Captain Sir E. Belcher.
o. ? Adult: skin: bad state. Nepal. Presented by B. H. Hodgson, Esq.
p. Thirteen inches long. From the Collection of the Zoological Society.

The peculiarities of the *skeleton* have been noticed by Cuvier. The structure of the skull is that of a Sciænoid fish, but the number of the vertebræ and the long anal fin are characters by which it approaches more to the fishes of the present family. The length of the abdominal portion of the vertebral column is to that of the caudal as 1 : 1·4.

Bleeker, with his usual precision, has given distinct characters for the following species, to which, however, I cannot refer the Chinese specimens mentioned above, as they show all the characters attributed by Bleeker to *Sillago sihama*.

2. **Sillago japonica.**

Temm. & Schleg. Faun. Japon. Poiss. p. 23. pl. 10. f. 1; *Bleek. Act. Soc. Sc. Indo-Nederl.* iii. *Japan*, p. 11, and *Bali*, iii. p. 163.

D. 11 | $\frac{1}{22}$. A. $\frac{2}{22-23}$. L. lat. 74.

Only three longitudinal series of scales between the spinous dorsal and the lateral line. The height of the body is $6\frac{1}{3}$ to 7 times in the total length, the length of the head $4\frac{1}{3}$ to $4\frac{1}{2}$. The diameter of the eye is one-fourth of the latter, and equals the interorbital space. The ventral spine is feeble. Coloration uniform.

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* Rüppell found two pyloric appendages, Cuvier four. In the specimens in the British Museum the intestines do not admit of an examination.

Molucca and Japanese Seas.

3. Sillago maculata.

Sillago maculata, *Quoy & Gaim. Voy. Freyc. Zool.* p. 261. pl. 53. f. 2; *Cuv. & Val.* iii. p. 411; *Bleeker, Perc.* p. 62, and *Bali*, iii. p. 161.
—— bassensis, *Cuv. & Val.* iii. p. 412*; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 672. pl. 1. f. 2.

D. 11 | $\frac{1}{20}$. A. $\frac{1}{21}$. L. lat. 70. L. transv. $\frac{5\text{–}6}{?}$.

The height of the body is $5\frac{1}{3}$ in the total length, the length of the head four times; the space between the eyes is one-half the length of the snout. The ventral spine feeble. On each side seven or eight blackish blotches and a yellow longitudinal band; the second dorsal dotted with blackish.

Coasts of South-eastern Australia; East Indian Archipelago.

a–c. Adult: very bad state; have been in chloride of zinc. Sydney. From the Haslar Collection.

d, e. Adult: very bad state; have been in chloride of zinc. Sydney. From the Haslar Collection.

4. Sillago punctata.

Cuv. & Val. iii. p. 413; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 671 pl. 1. f. 1.

D. 12 | $\frac{1}{26}$. A. $\frac{1}{22}$. L. lat. 170. L. transv. 35. Cæc. pylor. 4.

The height of the body is eight times in the total length, the length of the head $4\frac{1}{2}$. Body with numerous black dots above the lateral line; fins immaculate.

Australian Seas.

a. Adult: skin: not good state. Hobson's Bay, Port Phillip.
b. Many young specimens in a bad state. South Australia.
c. Young. South Australia. From Mr. Dring's Collection.

5. Sillago ciliata.

Cuv. & Val. iii. p. 415; *Cuv. Règne Anim. Ill. Poiss.* pl. 13. f. 2.

D. 11 | $\frac{1}{17\text{–}18}$. A. $\frac{2}{15\text{–}16}$. L. lat. 63. L. transv. 5/12.

The height of the body is $5\frac{1}{2}$ in the total length, the length of the head nearly four times; the space between the eyes is $2\frac{1}{4}$ in the length of the snout. The ventral spine feeble. Silvery, with a yellowish longitudinal streak; the first dorsal marbled with blackish, the second with four or five series of oblong spots.

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* Cuvier (*l. c.*) states the number of the anal fin as $\frac{1}{12}$; the figure in the *Voyage de l'Astrolabe* shows twenty-one rays.

Australian Seas.

a. Adult female. Van Diemen's Land. Presented by Lieut. A. J. Smith.
b. Large specimen. Australia. From Mr. Macgillivray's Collection.
c. Adult: skin. Port Jackson. Purchased of Mr. Gould.
d. Adult: stuffed. Cape York. Voyage of the 'Rattlesnake.' Native name *Koopooroo.*
e. Adult: skin. Voyage of H.M.S. Fly.
f. Adult: bad state. From the Haslar Collection.
g. Adult: bad state Old Collection.

Air-bladder spindle-shaped, extending between the muscles of the tail.

6. **Sillago macrolepis.**

Bleeker, Bali, iii. p. 166.

D. $11 \mid \frac{1}{19\text{–}20}$. A. $\frac{2}{19}$. L. lat. 50–55. L. transv. 4/?

The height of the body is 6–$6\frac{1}{3}$ in the total length, the length of the head 4–$4\frac{2}{5}$; the diameter of the eye is $2\frac{1}{2}$ in the latter, and twice the interorbital space. Ventral spine feeble. Coloration uniform. (*Bleek.*)

Seas of Batavia and Bali.

7. **Sillago chondropus.**

Bleeker, Perc. p. 61, and *Bali,* iii. p. 164.

D. $11 \mid \frac{1}{21}$. A. $\frac{1}{23}$. L. lat. 70. L. transv. 5/11.

The height of the body is $7\frac{1}{2}$ in the total length, the length of the head nearly five times. The space between the eyes is one-half the length of the snout. The ventral spine curved, very thick, flexible. Coloration uniform.

Molucca Sea.

a. Adult. Molucca.

8. **Sillago domina.**

Cuv. & Val. iii. p. 415. pl. 69; *Règne Anim. Ill.* pl. 13. f. 1; *Cantor, Catal.* p. 21.

D. $9 \mid \frac{1}{27}$. A. $\frac{1}{27}$. L. lat. 86.

The second dorsal spine very long, sometimes reaching to the root of the caudal; the ventral spine feeble. The space between the eyes is $2\frac{1}{2}$ in the length of the snout. Coloration uniform brownish.

Bay of Bengal; East Indian Archipelago.

a. Adult: stuffed. Ganges, at Calcutta. From Mr. Warwick's Collection.
b. Adult: stuffed: not good state. Bay of Bengal. Presented by the Zoological Society.

c. Half-grown. Bay of Bengal. Presented by the Zoological Society.
d. Adult. India. Presented by G. R. Waterhouse, Esq.
e–g. Adult: stuffed. India. From the Collection of the East India Company.

10. ELEGINUS*.

Eleginus, *Cuv. & Val.* v. p. 158.

Body elongate, somewhat cylindrical; cleft of the mouth small, with the upper jaw rather longer; eye lateral. Scales rather small, minutely ciliated. Two dorsals, the first with eight or nine spines; ventrals jugular; the lower pectoral rays branched. Villiform teeth in the jaws, none on the palate. Operculum without spine, præoperculum entire. Six branchiostegals; pseudobranchiæ. Air-bladder none; pyloric appendages in small number.

Falkland Islands; coast of Chile; Port Jackson.

1. Eleginus maclovinus.

Eleginus maclovinus, *Cuv. & Val.* v. p. 158. pl. 115 (not good); *Less. Voy. Coq. Zool.* ii. p. 202. pl. 17 (Atherina macloviana) (bad); *Gay, Hist. Chil. Zool.* ii. p. 186.
—— falklandicus, *Richards. Voy. Ereb. & Terr. Fishes,* p. 30. pl. 20. f. 1–3 (very good).

D. 8 | 26. A. 24. L. lat. 64. L. transv. 6/18. Cæc. pylor. 4.

The spines and rays of the dorsal striolated with brown. The height of the body is one-fifth of the total length; angle of the præoperculum rounded, obtuse. Greenish, with small blackish specks.

Falkland Islands.

a. Fourteen inches long. Falkland Islands. Presented by W. E. Wright, Esq.
b–d. Adult: bad state; have been in chloride of zinc. Falkland Islands. Presented by Sir J. Richardson.—Types of *E. falklandicus.*
e. Adult. Berkeley Sound (Falkland Islands). Presented by Sir J. Richardson.
f, g. Adult: not good state. From the Collection of the East India Company.

2. Eleginus chilensis.

Cuv. & Val. ix. p. 480; *Gay, l. c.* p. 187, *Atl. Ictiol.* lam. 3. f. 1.

D. 9 | 25. A. 23.

The height of the body is one-sixth of the total length; angle of the præoperculum nearly rectangular. Greenish: the second dorsal and the caudal sometimes dotted with blackish.

Coast of Chile.

a. Adult: very bad state. Chile. From Mr. Bridge's Collection.

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* 1. Eleginus bursinus, *Cuv. & Val.* v. p. 161.—Port Jackson.

11. EPICOPUS*

Merlus, *Guichen. in Gay's Hist. Chil. Zool.* ii. p. 328.

Body elongate, compressed posteriorly; snout long, depressed, with the cleft of the mouth wide, and with the lower jaw rather longer. Eye lateral. Scales small. Two dorsals, the first with nine or eleven feeble spines; ventrals jugular, with one spine and six soft rays; the lower pectoral rays branched. Jaws, vomer, and palatine bones with strong, cardiform teeth. Opercles not armed. Branchiostegals six; gill-membrane not joined to the isthmus underneath.

Coast of Chile.

1. Epicopus gayi.

Merlus gayi, *Guichen. l. c.* p. 328, *Ictiol.* lam. 8. fig. 2.

D. 10 | 36. A. 37. V. 1/6.

The length of the intermaxillary is nearly one-half of that of the head. Ventrals longer than pectorals. Coloration uniform.

Coast of Chile.

a. Bad state. Old Collection.

Guichenot refers this fish to the *Gadidæ*, and to the genus *Merluccius*, for which name he substitutes the French form of *Merlus*. I have, however, convinced myself that the first dorsal is composed of rays which are neither articulated nor branched; therefore the fish probably belongs to the Acanthopterygians. The specimen is too badly preserved to admit of an examination of the internal parts.

12. PERCOPHIS.

Percophis, *Cuv. & Val.* iii. p. 281.

Cylindrical, very elongate; cleft of the mouth nearly horizontal, with the lower jaw very prominent; eye lateral. Scales small, ctenoid. Two separate dorsals, the first with about ten spines; ventrals jugular; the lower pectoral rays branched. Teeth in the jaws, on the vomer and on the palatines, with very strong canines. Operculum with small spines, præoperculum entire. Seven branchiostegals; pseudobranchiæ. Air-bladder none; pyloric appendages.

Coast of Brazil.

1. Percophis brasilianus.

Quoy & Gaim. Voy. Freyc. Zool. p. 351. pl. 53. f. 1; *Cuv. & Val.* iii. p. 281. pl. 64, ix. p. 460; *Jenyns, Zool. Beagle, Fishes,* p. 23; *Cuv. Règne Anim. Ill. Poiss.* pl. 16. f. 2.

D. 10† | 32. A. 42.

The distance between the two dorsal fins equals the length of the base of the first.

Coast of Brazil.

a. Fine specimen. Rio Janeiro. Presented by A. Fry, Esq.

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* ἐπικωπος, provided with oars.

† Cuvier states seven dorsal spines in the text, but the figure shows nine.

13. CHÆNICHTHYS.

Chænichthys, *Richards. Voy. Ereb. & Terr. Fishes*, p. 12.

Body rather elongate, slightly compressed; head very large, with the snout spatuliform, and with the cleft of the mouth very wide, and the lower jaw longest. Eye lateral. Scales none; lateral line with granulated plates. Two dorsals, the first with seven spines; ventrals jugular; the lower pectoral rays branched. In both the jaws cardiform teeth; palate smooth. Opercles armed. Six branchiostegals; gill-membrane joined to the isthmus underneath; pseudobranchiæ. Air-bladder none; pyloric appendages in small number.

Kerguelen's Land.

1. Chænichthys rhinoceratus.

Richards. l. c. p. 13. pl. 6. f. 1–3 (ventrals too short).

D. 7 | 34–35. A. 33. Cæc. pylor. 2.

Snout with a hook-like spine in front; operculum with four or five spines, radiating from a common centre; the second and third dorsal spines very slender and elongate, more than one-half the length of the head. Lateral line with a series of granulated scales; beneath it, along the middle of the side of the tail, a series of round, bony, granulated plates.

Kerguelen's Land.

a. Adult. Kerguelen's Land. Presented by the Lords of the Admiralty.—Type of the species.

b. Adult: stuffed.

14. BOVICHTHYS.

Bovichtus (!), *Cuv. & Val.* viii. p. 486.

General aspect cottoid; posterior portion of the body compressed; cleft of the mouth horizontal, with the upper jaw rather longer; eye lateral, more or less directed upwards. Scales none. Two separate dorsals, the first with eight spines; ventrals jugular; the lower pectoral rays simple. Villiform teeth in the jaws, on the vomer and the palatine bones, without canines. Operculum with a strong spine; præorbital and præoperculum not armed. Seven branchiostegals.

South Pacific; Antarctic Ocean.

1. Bovichthys diacanthus.

Callionymus diacanthus, *Carmich. Trans. Linn. Soc.* xii. p. 501. pl. 26.
Bovichtus diacanthus, *Cuv. & Val.* viii. p. 487. pl. 244; *Gay, Hist. Chil. Zool.* ii. p. 171.

D. 8 | 20. A. 14.

The soft dorsal higher than the body beneath; the length of the base of the spinous dorsal is less than one-half of that of the soft; eyes slightly directed upwards; the width of the interorbital space one-half the length of the diameter of the eye. Olive, marbled with darker and dotted with white.

Coasts of South America.

2. Bovichthys variegatus.

Richards. Voy. Ereb. & Terr. Ichthyol. p. 56. pl. 34. f. 1–4.

D. 8 | 18. A. 13.

The soft dorsal is as high as the body beneath; the length of the base of the spinous dorsal is equal to, or more than, one-half of that of the soft; eyes slightly directed upwards; the width of the interorbital space is one-half the length of the diameter of the eye. Back with five brown cross-bars.

Port Jackson.

a. Fine specimen. From the Haslar Collection. *b.* Adult. From the Haslar Collection.	Types of the species.

3. Bovichthys psychrolutes.

D. 8 | 20. A. 14.

Head slightly compressed; eye lateral, not directed upwards; the width of the interorbital space is somewhat less than the diameter of the eye. Uniform bluish-olive.

Antarctic Ocean.

a. Lat. 50° S., Long. 172° W. Antarctic Expedition.

Description of the specimen.—The body and the head are slightly compressed and somewhat elongate; the height of the body is five times in the total length, the length of the head (without opercular spine) $3\frac{2}{3}$. The upper surface of the head is smooth and rather flat, with a pair of slight ridges between the orbits; the width of the space between the orbits is rather less than the diameter of the eye, which, of moderate size, equals the extent of the snout. The operculum is armed with a long straight spine. The two dorsal fins are separated from each other and, like the anal, of moderate height; the spines of the first are flexible. The caudal is subtruncated; the pectoral large, rounded, with the five lower rays simple, and thicker than the upper ones. The ventrals also are rather elongate, and reach to the vent; they are composed of one spine and five rays, and are rather remote from each other. There is no scale visible; the lateral line appears to be rough. Teeth are perceptible in the jaws and on the vomer, whilst the existence of those of the palatine bones can only be perceived by the touch. The colour is uniform bluish-olive.

Total length 20 lines.

15. TRICHODON.

Trichodon, (*Steller*) *Cuv. & Val.* iii. p. 152.

Body compressed, elongate, with the abdomen trenchant; cleft of the mouth nearly vertical; eye lateral. Scales none. Two dorsals;

the spinous low, but as long as the soft; ventrals thoracic; the lower pectoral rays simple. Villiform teeth in the jaws and on the vomer, none on the palatine bones. Præorbital and præoperculum armed. Five branchiostegals.

Coast of Kamtschatka.

1. Trichodon stelleri.

Trichodon, *Steller.*

Trachinus trichodon, *Pall. Zoogr.* iii. p. 235; *Tiles. Mém. Acad. Pétersb.* 1813, p. 466. pl. 15. f. 8.

Trichodon stelleri, *Cuv. & Val.* iii. p. 154. pl. 57; *Richards. Faun. Bor. Amer. Fishes,* p. 29.

D. 14 | 17. A. 29–30. Vert. 48.

Præorbital with two denticulations anteriorly; præoperculum with five strong spinous teeth.

Coast of Kamtschatka.

Third Group. PINGUIPEDINA.

Head and body more or less compressed, covered with scales; eye lateral. Lateral line continuous. Intermaxillary with a larger tooth on its posterior portion (labroid). Air-bladder present.

Synopsis of the Genera.

Palate with teeth	16. Pinguipes.
Palate without teeth; præoperculum serrated	17. Latilus.

16. PINGUIPES.

Pinguipes, *Cuv. & Val.* iii. p. 277.

Body cylindrical; cleft of the mouth slightly oblique; eye lateral. Scales small, minutely ciliated. One contiguous dorsal, with five to seven spines; ventrals thoracic, or a little before the pectorals; the lower pectoral rays branched. A villiform band of teeth in the jaws, with stronger outer ones; teeth on the vomer and palatines. Operculum with small spines; præoperculum entire. Six branchiostegals. Air-bladder present; pyloric appendages in small number.

Coasts of Tropical America.

1. Pinguipes brasilianus.

Cuv. & Val. iii. p. 277. pl. 93, ix. p. 455.

B. 6. D. $\frac{7}{27}$. A. 27. L. lat. 85. Vert. 38.

Ventrals thick, a little before the pectorals. The height of the body is $5\frac{1}{3}$ in the total length. Uniform brownish; the vertical fins and the ventrals blackish. (*Cuv.*)

Coast of Brazil.

2. Pinguipes chilensis.

Esox chilensis, *Molina.*
Pinguipes chilensis, *Cuv. & Val.* ix. p. 457; *Jenyns, Zool. Beagle, Fishes,* p. 22; *Gay, Hist. Chile, Zool.* ii. p. 165. lam. 2. f. 2; *Cuv. Règne Anim. Ill. Poiss.* pl. 16. f. 1.

D. $\frac{5\text{-}6}{28\text{–}29}$. A. 26–28. L. lat. 100. Cæc. pylor. 4.

Ventrals thick, a little before the pectorals. Brownish, with two rows of round whitish spots on each side; a black spot at the root of the upper caudal lobe, disappearing with age; the anterior part of the dorsal blackish.

Coast of Chile.

a. Fine specimen. Chile. From Mr. Bridge's Collection.

3. Pinguipes fasciatus.

Jenyns, l. c. p. 20. pl. 5.

D. $\frac{7}{27}$. A. 25.

Ventrals thick, exactly thoracic. The height of the body is $5\frac{1}{2}$ in the total length. Back brown; on the sides are twelve dark cross-bars, the alternate ones broader than the others. (*Jen.*)

Coast of Northern Patagonia.

17. LATILUS.

Latilus, *Cuv. & Val.* v. p. 368.

Body rather elongate, slightly compressed; cleft of the mouth horizontal, with the jaws equal; eye lateral. Scales small, finely ciliated. One continuous dorsal, with four to eight spines; ventrals thoracic, or somewhat in advance of the pectorals; the lower pectoral rays branched. Villiform teeth in the jaws, with canines; none on the palate. Operculum without spine; præoperculum denticulated. Six branchiostegals; pseudobranchiæ. Air-bladder simple; pyloric appendages in small number.

Indian Ocean and Archipelago; East Pacific; coast of Brazil.

1. Latilus argentatus.

Coryphæna sima, *Bl. Schn.* p. 296.
? Coryphæna sinensis, *Lacép.* iii. pp. 176, 209.
Latilus argentatus, *Cuv. & Val.* v. p. 369, ix. p. 495; *Faun. Japon. Poiss.* p. 63. pl. 28. f. 2 (not good); *Bleek. Verh. Batav. Genootsch.* xxvi. p. 85.

D. $\frac{7}{14}$. A. $\frac{2}{11}$. L. lat. 60–65.

The height of the body equals the length of the head, and is $4\frac{1}{2}$ in the total. Caudalis rounded; the spinous portion of the dorsal lower than the soft. Præoperculum very finely serrated. Coloration uniform rose-coloured.

Japanese and Chinese Seas.

a. Adult. China. Presented by Sir J. Richardson.
b. Adult: stuffed.

2. Latilus chrysops.

Cuv. & Val. ix. p. 496.

B. 6. D. $\frac{7}{24}$. A. 22. L. lat. 120.

The height of the body is $4\frac{3}{4}$ in the total length, the length of the head $4\frac{1}{2}$. Caudalis emarginate; the spinous portion of the dorsal lower than the soft. Præoperculum with the posterior limb denticulated. Red, marbled with yellow; a yellow band below the eye.

Coast of Brazil; Caribbean Sea.

a. Adult: stuffed. West Indies. Purchased of Mr. Scrivener.

3. Latilus doliatus.

Cuv. & Val. v. p. 371. pl. 130.

D. $\frac{5-6}{16}$. A. $\frac{2}{12}$. L. lat. 115. Cæc. pylor. 1.

The height of the body is $4\frac{1}{2}$ in the total length, the length of the head five times. Caudalis emarginate; the spinous portion of the dorsal lower than the soft. Præoperculum finely serrated. Silvery, with from fifteen to eighteen brownish-yellow cross-bands.

Ile de France.

a. Adult: stuffed. Ile de France.

4. Latilus jugularis.

Cuv. & Val. ix. p. 500. pl. 279; *Jenyns, Zool. Beagle, Fishes,* p. 50; *Gay, Hist. Chile, Zool.* ii. p. 203.

B. 6. D. $\frac{4}{28}$. A. $\frac{2}{21}$. L. lat. 80. Cæc. pylor. 4.

The height of the body is $5\frac{1}{3}$ in the total length, the length of the head four times. Caudalis truncated. The posterior limb of the præoperculum with small spinous teeth. Brownish, marbled with darker.

Coast of Valparaiso.

There is no larger tooth at the posterior extremity of the intermaxillary in this species.

a. Adult. Chile. From Mr. Bridge's Collection.

5. Latilus princeps.

Jenyns, Zool. Beagle, Fishes, p. 52. pl. 11.

D. $\frac{8}{26}$. A. $\frac{2}{26}$.

The height of the body equals the length of the head, and is $4\frac{1}{2}$

in the total. Caudalis emarginate; the spinous portion of the dorsal lower than the soft; the posterior limb of the præoperculum finely denticulated. Uniform brownish. (*Jen.*)

Chatham Island (Galapagos Archipelago).

Fourth Group. PSEUDOCHROMIDES.

Pseudochromidæ, pt., *Müll. & Trosch. Hor. Ichthyol.* iii. p. 22.

Eyes more or less lateral. Head not cuirassed. Lateral line interrupted, or not continued to the caudal.

Synopsis of the Genera.

Cleft of the mouth large; the upper maxillary produced backwards	18. Opisthognathus.
Lateral line interrupted; vomerine and palatine teeth	19. Pseudochromis.
Lateral line interrupted; teeth on the vomer, none on the palatine bones; dorsal spines in small number	20. Cichlops.
Lateral line interrupted; dorsal, anal and ventral spines none	21. Pseudoplesiops.
Lateral line interrupted, the posterior portion continued to the caudal; palate smooth	22. Notothenia.
Scales none	23. Harpagifer.

18. OPISTHOGNATHUS.

Opisthognathus, *Cuv. Règne Anim.*; *Cuv. & Val.* xi. p. 495.

Body rather elongate, rounded anteriorly, slightly compressed posteriorly; the upper profile of the snout parabolic; cleft of the mouth large, *the upper maxillary produced backwards*; eye lateral, large. Scales small, not ciliated. Lateral line not continued to the caudal. One dorsal, with the unarticulated rays flexible; ventrals jugular; the lower pectoral rays branched. In both the jaws fine cardiform teeth; palate smooth. Opercles not armed. Six branchiostegals; the gill-membranes joined together inferiorly; pseudobranchiæ. Air-bladder small; pyloric appendages none.

Red Sea; East Indian Seas; coast of Brazil.

1. Opisthognathus nigromarginatus.

Opisthognathus nigromarginatus, *Rüpp. Atl. Fische*, p. 114. taf. 28. f. 4.

—— sonneratii, *Cuv. Règne Anim.* (without descr.); *Cuv. & Val.* xi. p. 498.

—— cuvieri, *Valenc. in Cuv. Règne Anim. Ill. Poiss.* pl. 78. fig. 3, but not in *Cuv. & Val. Hist. Nat. Poiss.* xi., where the same author describes a very different species with the same name!

D. 24. A. 15.

The upper maxillary prolonged nearly to the pectoral. Scales exceedingly small. The height of the body is six times in the total length, the length of the head $3\frac{3}{4}$; the distance between the eyes is one-half of their diameter. Yellowish, marbled with brown; maxillaries with a black inferior margin. A black ovate spot between the fourth and eighth dorsal rays.

Red Sea; coast of Pondicherry.

2. Opisthognathus megastoma.

D. 27. A. 18.

The upper maxillary is very long, and reaches to, or slightly beyond, the base of the pectoral fin. Scales exceedingly small. The height of the body is one-fifth of the total length, the length of the head one-third. The distance between the eyes is one-fifth of their diameter. An ovate black spot between the seventh and tenth dorsal rays.

Gulf of Mexico.

a. Adult. Gulf of Mexico. From the Haslar Collection.
b. Adult. Gulf of Mexico. From the Haslar Collection.

Description.—This species is very closely allied to *O. nigromarginatus*, from which, however, it may be readily distinguished by the characters in the diagnosis. The greatest depth of the body is below the origin of the dorsal, where it is contained five times in the total. The head is very large and thick, its length being one-third of the total. The occiput and the nape of the neck are broad, the space between the eyes very narrow, and the snout short and obtuse. The cleft of the mouth is slightly oblique and exceedingly wide, its angle being placed behind the posterior margin of the orbit. The intermaxillary is elongate, and reaches as far backwards as the cleft of the mouth. The maxillary is prolonged into a dilated, flexible, sabre-shaped appendage, which extends to, or slightly beyond, the base of the ventral; its upper margin is fixed to the mandibula by a wide membrane, which has a large ovate opening. An additional and moveable bone, attached to the maxillary, supports the membrane above the opening. The eye is very large, $3\frac{1}{2}$ in the length of the head, and slightly directed upwards. The nostrils are small, without appendage. The margin of the præoperculum is rounded, and partly covered by the overlapping maxillary. A rather feeble opercular spine is hidden by the skin, and the extremity of the suboperculum extends beyond this spine. The gill-opening is wide, but does not extend on the upper side of the præoperculum; the branchial membranes of both sides are slightly joined on the throat.

The dorsal fin begins above the extremity of the operculum, and is of nearly equal height in all its length. The unarticulated rays pass insensibly into the articulated ones; all are flexible. The distance between the dorsal and caudal fins is equal to the height of the tail below the end of the dorsal. The caudal is slightly rounded, one-seventh of the total length. The origin of the anal falls vertically below the twelfth dorsal ray, and its end opposite to that of the dorsal; it equals that fin in height. The pectoral is short, rounded, about one-eighth of the total length, and does not extend to the origin of the anal. The ventrals are jugular, pointed, and composed of one spine and five rays.

The scales are exceedingly small, and nearly entirely hidden in the pouches of the cutis. The lateral line is straight, very near the dorsal line, and lost below the posterior half of the dorsal fin.

The teeth in both the jaws are widely set, of moderate size, and form a single series.

The ground-colour is now yellowish-white, dotted and sprinkled with brown. There is an ovate black spot between the seventh and tenth dorsal rays. The interior surface of the maxillary is marked with two black bands, which, at the posterior extremity of the bone, pass on to the membrane in a strong curvature. There is a third band at the outside of the membrane, running from the opening to the middle of the mandibula.

	inches.	lines.
Total length	6	6
Height of the body	1	3
Length of the head	2	1
Diameter of the eye	0	7
Distance between the eyes	0	1½
Greatest height of the dorsal and anal	0	9½
Length of the caudal	0	11
——— of the pectoral	0	10

3. **Opisthognathus cuvieri.**

Cuv. & Val. xi. p. 504. pl. 343.

D. 28. A. 18. L. lat. 70.

The upper maxillary reaches beyond the vertical from the posterior margin of the orbit. Scales small. The diameter of the eye is 3½ in the length of the head. A black ovate spot between the fourth and eighth dorsal spines.

Coast of Bahia.

4. **Opisthognathus solorensis.**

Bleeker, Solor, p. 81

D. 25. A. 16. L. lat. 65.

The upper maxillary reaches to the angle of the præoperculum. Scales small. The height of the body is 6½ in the total length, the length of the head 4⅕. The dorsal fin with two black spots anteriorly. (*Bl.*)

Sea of Lawajong (Island of Solor).

5. **Opisthognathus rosenbergii.**

Bleeker, Nias, p. 220.

D. 24. A. 15.

The upper maxillary does not reach to the angle of the præoperculum. Scales small. No black spot on the dorsal. (*Bl.*)

Sea of Nias.

19. PSEUDOCHROMIS.

Pseudochromis, *Rüpp. N. W. Fische*, p. 8.

Head and body rather compressed, more or less elongate; cleft of the mouth slightly oblique, with the lower jaw longest; eye lateral. Scales of moderate size, ciliated; lateral line interrupted. One dorsal, with a few spines anteriorly; ventrals thoracic; the lower pectoral rays branched. Jaws with cardiform teeth, anteriorly with canines; vomer and palatine bones toothed. Præoperculum entire. Six branchiostegals; the gill-membranes joined inferiorly; pseudobranchiæ and air-bladder present; pyloric appendages none.

Red Sea; East Indian Archipelago.

1. Pseudochromis olivaceus.

Rüppell, N. W. Fische, p. 8. tab. 2. fig. 3.

D. $\frac{3}{27}$. A. $\frac{3}{15}$. V. 1/5.

The height of the body is four times in the total length, the length of the head $4\frac{1}{2}$. Dorsal and anal produced posteriorly and pointed; caudal truncated; most of the dorsal rays not branched. Olive-green, with some scattered blue spots; operculum with a black spot posteriorly. (*Rüpp.*)

Red Sea.

2. Pseudochromis fuscus.

Müll. & Trosch. Hor. Ichthyol. iii. p. 23. tab. 4. fig. 2; *Bleek. Natuurk. Tydschr. Nederl. Ind.* iii. p. 708, and ix. p. 69.

B. 6. D. $\frac{3}{26-27}$. A. $\frac{3}{14}$. V. 1/5. L. lat. 40.

The height of the body equals the length of the head, and is one-fourth of the total. The length of the snout is less than that of the diameter of the eye, and equals the width of the interorbital space. Caudal rounded. Four series of scales on the cheek. Brown: the posterior half of the dorsal fin and the anal with blue longitudinal streaks; base of the pectoral black.

East Indian Archipelago.

3. Pseudochromis xanthochir.

Bleeker, Natuurk. Tydschr. Nederl. Ind. viii. p. 443.

B. 6. D. $\frac{3}{27}$. A. $\frac{3}{14}$. V. 1/5. L. lat. 40.

The height of the body equals the length of the head, and is one-fourth of the total. The snout is much shorter than the diameter of the eye. The maxillary reaches to below the anterior part of the eye. Brownish, with a dark streak along each series of scales; the upper part of the dorsal and the anal yellow, with blue longitudinal lines; pectorals yellow at the base. (*Bl.*)

Sea of Manado.

4. Pseudochromis adustus.

Müll. & Trosch. Hor. Ichthyol. iii. p. 23. tab. 4. fig. 3.

B. 6. D. $\frac{3}{26}$. A. $\frac{3}{14}$. V. 1/5.

The height of the body equals the length of the head, and is one-fourth of the total. The length of the snout is equal to that of the diameter of the eye, and more than the width of the interorbital space. Most of the dorsal rays are branched. Dark brown; sides yellowish.

Philippine Islands.

5. Pseudochromis flavivertex.

Rüpp. N. W. Fische, p. 9. taf. 2. fig. 4.

D. $\frac{3}{27}$. A. $\frac{3}{15}$. V. 1/5. L. lat. 45. Vert. 10/15.

The height of the body equals the length of the head, and is $4\frac{1}{2}$ in the total. Dorsal and anal fins not produced posteriorly; caudal truncated, with the angles pointed; most of the dorsal rays not branched. Violet, with a yellow stripe along the upper part of the head and back; dorsal yellow.

Red Sea.

a. Adult. Red Sea.
b. Adult. Red Sea.

6. Pseudochromis tapeinosoma.

Bleeker, Amboina, iii. p. 115.

B. 6. D. $\frac{2}{21}$. A. $\frac{2}{13}$. V. 1/5. L. lat. 30.

The height of the body is five times in the total length, the length of the head $4\frac{1}{3}$. The snout is shorter than the eye; the maxillary reaches to below the middle of the eye. Caudal rounded. Brown. (*Bl.*)

Sea of Amboyna.

Pseudochromis cyanotænia, Bleeker, Booroo, ii. p. 72, is closely allied to this species; it is said to have eight or nine oblique blue bands on the body.

7. Pseudochromis polyacanthus.

Bleeker, Ternate, vii. p. 375.

B. 6. D. $\frac{7}{19}$. A. $\frac{3}{16}$. V. 1/5. L. lat. 50.

The height of the body is $4\frac{1}{4}$–$4\frac{1}{3}$ in the total length, the length of the head $3\frac{2}{3}$. The maxillary reaches behind the vertical from the posterior margin of the eye. The second anal spine is the longest. Greenish-brown, reticulated with brown; operculum with a dark spot. (*Bl.*)

Sea of Ternate.

20. CICHLOPS*

Cichlops, *Müll. & Trosch. Hor. Ichthyol.* iii. p. 24.

Head and body rather compressed, more or less elongate; cleft of the mouth oblique, with the lower jaw longest; eye lateral. Scales of moderate size, ciliated; lateral line interrupted. One dorsal, with a few spines anteriorly; ventrals inserted before or below the pectorals; the lower pectoral rays branched. Jaws with cardiform teeth, anteriorly with canines; vomer toothed, palatine bones toothless. Præoperculum entire. Six branchiostegals; pseudobranchiæ and air-bladder present; pyloric appendages none.

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* 1. Cichlops trispilos, *Bleeker, Gilolo,* ii. p. 110.—Sea of Gilolo.

East Indian Archipelago.

1. Cichlops cyclophthalmus.

Müll. & Trosch. l. c. tab. 4. fig. 1.

B. 6. D. $\frac{2}{25}$. A. $\frac{3}{15}$. V. 1/5.

The height of the body is $4\frac{1}{4}$ in the total length, the length of the head five times. The diameter of the eye is rather less than the length of the snout, but equal to the width of the interorbital space. Seven series of scales on the cheek. The dorsal begins above the base of the pectoral; the ventral is inserted somewhat before the pectoral. Brown: each scale with a darker spot; dorsal dotted with black.

Sunda Sea.

2. Cichlops melanotænia.

Bleeker, Celebes, iii. p. 765.

B. 6. D. $\frac{2}{25}$. A. $\frac{3}{14}$. V. 1/5. L. lat. 60.

The height of the body is four times in the total length, the length of the head five times; the snout is shorter than the eye. The dorsal begins before the base of the pectoral. Brownish-red, with ten black longitudinal streaks: fins red; dorsal anteriorly dotted with brown, posteriorly with small longitudinal stripes; base of the pectoral with a black spot superiorly. (*Bl.*)

Sea of Macassar.

3. Cichlops spilopterus.

Bleeker, Celebes, iv. p. 168.

B. 6. D. $\frac{2}{25}$. A. $\frac{3}{14}$. V. 1/5. L. lat. 60.

The height of the body is $3\frac{3}{5}$ in the total length, the length of the head $4\frac{1}{2}$. The length of the snout equals that of the eye. The dorsal begins before the vertical from the base of the pectoral, below which the ventral is inserted. Brown: dorsal anteriorly with small, posteriorly with oblong blue spots; base of the pectoral with a brown spot superiorly. (*Bl.*)

Sea of Macassar.

Cichlops hellmuthii, Bleeker, Sumbawa, p. 329, with a rather more varied coloration, and *Cichlops japonicus*, Gill, Proc. Acad. Nat. Sc. Philad. 1859, p. 147, are closely allied to this species.

21. PSEUDOPLESIOPS.

Pseudoplesiops, *Bleeker, Goram*, p. 215.

Head and body rather compressed, oblong; jaws equal anteriorly; eye lateral. Scales of moderate size, cycloid; lateral line interrupted. One dorsal, without spines; ventrals jugular, without spine. Jaws and vomer with a band of teeth, the former with canines; palatine bones toothless. Præoperculum entire. Six branchiostegals; pseudobranchiæ present.

East Indian Archipelago.

1. Pseudoplesiops typus.

Bleeker, Goram, p. 217.

B. 6. D. 25. A. 16. V. 5. L. lat. 36.

The height of the body is $3\frac{1}{3}$ in the total length (without caudal). The upper maxillary reaches to below the middle of the eye. Four series of scales on the cheek. The two outer rays of the ventral elongate and filiform. Yellowish. (*Bl.*)

Sea of Goram.

22. NOTOTHENIA*.

Notothenia, *Richards. Voy. Ereb. & Terr. Fishes*, p. 5.

Body more or less elongate, slightly compressed posteriorly, rounded anteriorly, with the head depressed; cleft of the mouth slightly oblique, with the lower jaw longest; eye directed upwards. Scales rather small, ciliated; lateral line interrupted. Two dorsals, the first separated from the second by a very deep notch, with the spines flexible (in one species stiff); ventrals jugular; the lower pectoral rays branched. In both the jaws cardiform or villiform teeth; palate smooth. Operculum with two obtuse points; præoperculum entire. Six branchiostegals; the gill-membranes joined inferiorly; pseudobranchiæ. Air-bladder none; pyloric appendages in small number.

Antarctic Seas; Falkland, Auckland, and Kerguelen's Islands. New Zealand.—Antipodes of *Cottus*.

1. Notothenia tessellata.

Richards. Voy. Ereb. & Terr. Fishes, p. 19. pl. 12. f. 2, 3.

D. 6 | 33–34. A. 33. L. lat. 66–70.

The length of the head is one-fourth of the total, the height of the body one-sixth. The upper surface of the head covered with scales nearly to the nostrils. Brown, with broad and rather irregular vertical bars; the second dorsal and the caudal brown-spotted.

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* 1. Notothenia phocæ, *Richards. l. c.* p. 8.—Antarctic Glacial Ocean.

2. Gadus magellanicus, (*Forst.*) *Bl. Schn.* p. 10; Notothenia magellanica, *Richards. l. c.* p. 9.—Terra del Fuego.

Falkland Islands.

a. Adult. Falkland Islands. Presented by W. E. Wright, Esq.
b. Adult. Falkland Islands. Presented by W. E. Wright, Esq.
c. Half-grown. Falkland Islands. Presented by W. E. Wright, Esq.
d. Half-grown. Falkland Islands. Presented by W. E. Wright, Esq.
} Types of the species.
e, *f*. Adult. From the Haslar Collection.

2. **Notothenia cyaneobrancha.**

Richards. Voy. Ereb. & Terr. Fishes, p. 7. pl. 4.

D. 5 | 35. A. 31–33. L. lat. 66. Cæc. pylor. 4 (5?).

The height of the body is $5\frac{1}{4}$ in the total length, the length of the head $4\frac{1}{2}$. The upper surface of the head scaleless. Uniform brownish; the vertical fins blackish; the gill-membrane with the margin coloured.

Kerguelen's Land.

a. Adult. Kerguelen's Land. Presented by the Lords of the Admiralty.—Type of the species.
b. Adult: bad state. Kerguelen's Land. From the Haslar Collection.
c, *d*. Adult. Presented by Sir J. Richardson.

3. **Notothenia coriiceps.**

Richards. Voy. Ereb. & Terr. Fishes, p. 5. pl. 3. f. 1, 2.

D. 5 | 35. A. 28. L. lat. 54. Cæc. pylor. 5.

The height of the body is $4\frac{1}{2}$ in the total length, the length of the head four times. The posterior limb of the præoperculum oblique. Brown: an oblique blackish-brown stripe between the eye and the angle of the præoperculum.

Coasts of Kerguelen's Land and of the Auckland Islands.

a. Adult. Kerguelen's Land. Presented by the Lords of the Admiralty.—Type of the species.
b. Adult: bad state.

4. **Notothenia cornucola.**

Notothenia cornucola, *Richards. Voy. Ereb. & Terr. Fishes*, p. 8. pl. 8. f. 4, 5 (bad), p. 18. pl. 11. f. 3, 4.
—— marginata, *Richards. l. c.* p. 18. pl. 12. f. 1, 2.

D. 5 | 31–33. A. 27–29. L. lat. 52.

The height of the body is $5\frac{1}{2}$ in the total length, the length of the head four times. Brownish, marbled with darker; an oblique light band, edged with dark brown, from below the eye to the lower limb of the præoperculum.

Cape Horn and Falkland Islands; New Zealand.

a. Falkland Islands. Presented by W. E. Wright, Esq.
b. Falkland Islands. Presented by W. E. Wright, Esq.
c. Falkland Islands. Presented by W. E. Wright, Esq.
Types of the species.
d. Falkland Islands. Presented by W. E. Wright, Esq.—Type of *N. marginata*.
e. New Zealand. Presented by Dr. Richardson.
f. Port Louis. From the Haslar Collection.

5. **Nototheniavirgata.**

Richards. Voy. Ereb. & Terr. Fishes, p. 18. pl. 11. f. 5, 6.

D. 6 | 32. A. 29. L. lat. 52.

The height of the body is five times in the total length, the length of the head $3\frac{3}{4}$. The upper surface of the head naked. Brownish, speckled with darker: a broad yellowish lateral band; a narrow band of the same colour on the back, along the base of the dorsal; an oblique, yellowish, brown-edged streak on the cheek.

Falkland Islands.

a. Falkland Islands. Presented by W. E. Wright, Esq.—Type of the species.

6. **Notothenia purpuriceps.**

Richards. l. c. p. 7. pl. 2. f. 3, 4.

D. 4 | 35. A. 31. L. lat. 52. Cæc. pylor. 5. Vert. 15/37.

The height of the body is nearly five times in the total length, the length of the head $3\frac{3}{4}$. The upper parts of the skull and the lower portion of the cheek scaleless. Brownish; no streak on the cheek. (*Rich.*)

Kerguelen's Land.

7. **Notothenia sima.**

Richards. Voy. Ereb. & Terr. Fishes, p. 19. pl. 77. f. 1, 2.

D. 6 | 28. A. 28. L. lat. 45.

The height of the body is one-sixth of the total length, the length of the head one-fourth. The upper surface of the head covered with irregular scales nearly to the nostrils. Brown, with six irregular vertical bars.

Falkland Islands.

a. Adult. Falkland Islands. Presented by W. E. Wright, Esq.
b. Adult. Falkland Islands. Presented by W. E. Wright, Esq.
Types of the species.
c. Half-grown. From the Haslar Collection.

8. **Notothenia macrocephalus.**

D. 5 | 30–31. A. 21. L. lat. 58.

The upper surface of the head broad and flat; the width of the interorbital space is contained twice and three-fourths in the length of the head. Lateral line interrupted below the third dorsal ray before the last.

Falkland Islands.

a. Fourteen inches long: stuffed. Falkland Islands. Purchased of Mr. Jamrach.

9. **Notothenia rossii.**

Notothenia (?) rossii, *Richards. l. c.* p. 9. pl. 5. f. 1, 2.

D. 7 | $\frac{1}{32}$. A. $\frac{1}{26}$. L. lat. 62.

The spines of the fins not flexible and very short. The length of the head is one-fourth of the total. (*Rich.*)

Hab. —— ?

23. HARPAGIFER.

Harpagifer, *Richards. Voy. Ereb. & Terr. Fishes,* p. 11.

Habit cottoid. Scales none; lateral line not continued to the caudal. Two dorsals, the first with three or four flexible spines; ventrals jugular; the lower pectoral rays branched. In both the jaws villiform teeth; palate smooth. Operculum and suboperculum with very long spines. Six branchiostegals; the gill-membranes attached to the isthmus between; pseudobranchiæ. Air-bladder none; pyloric appendages in small number.

Coasts of Cape Horn and of the Falkland Islands.—Antipodes of *Cottus.*

1. **Harpagifer bispinis.**

Callionymus bispinis, *Forster.*
Batrachus bispinis, *Bl. Schn.* p. 45.
Harpagifer bispinis, *Richards. l. c.* p. 11. pl. 7. f. 1–3, p. 19. pl. 12. f. 8, 9.
—— palliolatus, *Richards. l. c.* p. 20. pl. 12. f. 5–7.

D. 3–4 | 24. A. 18. Cæc. pylor. 3. Vert. 11/18.

Operculum with a very long antler-like spine above, directed upwards; suboperculum with a smaller spine directed backwards. Male with tentacles above the eye, and with the margin of the præoperculum fringed. Reddish-olive, with very large brown blotches, more or less confluent.

Cape Horn; Falkland Islands.

a–g. Fine specimens. Falkland Islands. Presented by W. E. Wright, Esq.
h. Fine specimen. Falkland Islands. Presented by W. E. Wright, Esq.
i. Adult male. Falkland Islands. Presented by W. E. Wright, Esq.
} Types of the species.

k. Adult female: skeleton. Falkland Islands. Presented by W. E. Wright, Esq.

l. Adult female. Falkland Islands. Presented by W. E. Wright, Esq.—Type of *Harpagifer palliolatus*.

m, n. Half-grown: bad state. Falkland Islands. From the Haslar Collection.

o–t. Adult and half-grown: bad state. Cape Horn.

u. Intestines of specimen *k*.

I may add to the notes on the anatomy of this fish given by Sir J. Richardson (*l. c.* p. 12), that the ovaria are separated, of moderate size, bean-like. The urine-bladder is deeply forked. That naturalist states twenty-four caudal vertebræ, whilst I find only eighteen.

Appendix to the Trachinidæ.

HETEROSTICHUS.

Heterostichus, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 143, and *U. S. Pacif. R. R. Exped. Fishes*, p. 36.

The following is the description given by Girard. The place which the fish will take in the system is not yet sufficiently clear; probably it is the type of a separate family

"First dorsal fin very long, the first five anterior rays of which constitute an apparently distinct fin. Anal very long, provided anteriorly with but few spines. Dorsal and anal extending to near the caudal. Body very compressed and flattened posteriorly. Caudal slender. Ventrals situated in advance of the pectorals. Lower jaw longest; mouth moderate. Canine teeth in the jaws, villiform teeth on the vomer and the palatines. Scales very small. Lateral line arched above the pectorals. Six branchial rays. Opercular apparatus without either spines or denticulations."

San Diego (California).

1. **Heterostichus rostratus.**

Girard, l. c. pl. 13.

D. $\frac{37}{13}$. A. $\frac{2}{34}$. V. 1/3.

The head is rather small and conical. The nose is very much depressed and concave. The greatest depth, measured above the pectorals, is contained five times in the entire length; the least depth is about a fourth or a fifth of the greatest. The head forms a little less than a fourth of the length. Lower jaw much the longer. The horizontal diameter of the eye is $7\frac{1}{2}$ in the length of the side of the head. The first five rays constitute an apparently distinct fin, subtriangular in shape and much higher than the portion which follows, and which, upon its anterior half, is higher than upon its posterior half. The soft dorsal is short, but high, and in perfect continuity with the spinous one. The caudal is slender and forked; the ventrals are quite small and slender. Yellowish-brown, marbled with darker.

San Diego

Fam. 12. SCIÆNIDÆ.

Sciænoidei, pt., *Cuv. Règne Anim.*; *Cuv. & Val.* v. p. 1; *Müller, Berl. Abhandl.* 1844, p. 201.

Sciænidæ, pt., *Owen, Lect. Comp. Anat. Vert.* i. p. 49; *Richardson, Ichthyol.*

Body compressed and rather elongate, covered with ctenoid scales. Lateral line continuous, and often continued on the tail. Mouth in front of the snout. Eye lateral, of moderate size. Seven branchiostegals. Teeth in villiform bands, with canines in some of the genera; no molars or trenchant teeth in the jaws; no teeth on the palate. Cheek not cuirassed; the opercles not, or feebly, armed. *Two dorsal fins, the soft much more developed than the spinous or the anal*; the spines of the first dorsal generally feeble and elevated; the anal fin with two spines. All the rays of the pectorals branched; ventrals thoracic, with one spine and five soft rays. The bones of the head with the muciferous system very developed. Stomach cæcal; pyloric appendages in small or moderate number. Air-bladder* with branching or very elongate appendages, sometimes absent. Pseudobranchiæ sometimes hidden.

Mostly inhabitants of the seas of the temperate and tropical regions; a few inhabiting the fresh waters of America, Africa, and the East Indies. Not to be found in Australia.

Synopsis of the Genera.

A. *Lower jaw with barbels.*

Chin with many small barbels. Pharyngeal teeth pavement-like	2. Pogonias.
Chin with several minute barbels. Pharyngeal teeth conical and pointed	3. Micropogon.
One single barbel	4. Umbrina.
Two barbels. The pectoral and caudal fins very elongate	13. Lonchurus.

B. *Barbels none.*

The lower jaw longest; no large canines; air-bladder simple.	1. Larimus.
Dorsal and caudal fins covered with scales; the first dorsal very elevated; anal spines feeble	5. Eques.
Dorsal and caudal fins covered with scales; anal spines strong	6. Pachyurus.

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* Air-bladder simple in *Larimus* and *Eques*.

The upper jaw overlapping the lower, or both the jaws equal; dorsal not scaly; no large canines; the space between the eyes moderately broad and slightly convex. Anal spines rather feeble, more or less indistinct	7. SCIÆNA.
The upper jaw overlapping the lower, or both the jaws equal; dorsal not scaly; no large canines; the space between the eyes moderately broad and slightly convex. Anal spines strong	8. CORVINA.
The lower jaw longest; generally large conical canines; air-bladder with two elongated horns	9. OTOLITHUS.
The lower jaw longest; large arrow-shaped canines; air-bladder with two elongated horns	10. ANCYLODON.
The space between the eyes very broad and very convex; eye small; cleft of the mouth very wide and oblique...	11. COLLICHTHYS.
Eye small; limbs of the præoperculum with a scaleless space	12. NEBRIS.

1. LARIMUS.

Larimus, *Cuv. & Val.* v. p. 145.
Corvina, sp., *Cuv. & Val.* v. p. 139.

Body oblong; muzzle shorter than the eye, with the cleft of the mouth oblique, and the lower jaw longer than the upper. No large canines. No barbel. Dorsal fin not scaly. Pseudobranchiæ; the air-bladder simple. Pyloric appendages in moderate number.

Tropical parts of the Atlantic, entering the rivers.

1. Larimus auritus.

Cuv. & Val. viii. p. 501.

D. $11 \left| \frac{1}{13} \right.$. A. $\frac{3}{9}$. L. lat. 50. L. transv. $\frac{6}{12}$. Vert. 11/15.

The height of the body equals the length of the head, and is $3\frac{2}{3}$ in the total. The diameter of the eye is nearly one-fourth of the length of the head, and equals the interspace between the eyes, but is rather longer than the snout. Lower jaw slightly prominent; the upper maxillary does not reach to below the middle of the eye. The spinous dorsal is one-fourth higher than the soft; caudal fin slightly notched; the pectoral is pointed and rather elongate, and reaches to the level of the vent. Coloration nearly uniform, with more or less distinct longitudinal bands along each series of scales. A black spot on a part of the opercular membrane, filling a deep notch of that bone. Dorsal fins grey, with a series of small blackish spots along the base; the other fins minutely dotted with black.

Coast of Gorea; River Niger.

a. Fine specimen. River Niger. From Mr. Fraser's Collection.
b. Adult. River Niger. From Mr. Fraser's Collection.

c. Half-grown. River Niger. From Mr. Fraser's Collection.
d. Adult: skeleton. River Niger. From Mr. Fraser's Collection.

Pseudobranchiæ well developed. Air-bladder simple.

Skeleton.—The maxillary bone gradually widens from the base to its extremity, which is not very broad. The intermaxillary is rather slender, tapering to a very fine point, and is armed in all its length with a narrow band of fine villiform teeth, and with an outer series of more distant and very small teeth; its posterior processes extend backwards to the level of the anterior margin of the eye, being one-third only of the length of the bone; there is, besides, a flat triangular process nearly in the middle of its posterior margin. The muciferous channel of the mandibulary is not very deep, and divided into four cavities by three feeble bony cross-bars. The tympanic and pterygoid bones have a more solid osseous centre, and the rest exceedingly thin and fragile. The anterior portion of the vomer is triangular, excavated, with rather projecting anterior edges; the posterior is very feeble, tapering to a long, fine point.

The bony ridges and crests at the upper surface of the skull are peculiarly arranged. The occipital crest is very elevated above the surface of the skull, and its horizontal portion is rather higher than the vertical; it does not extend beyond the suprascapula. There is no central cavity, but all the cavities are arranged in pairs. The first pair occupies the anterior portion of the frontal bones; the second is situated more in the centre of the distance between the eyes, and occupies the middle of the frontals; the third and fourth are elongated, and placed more outwards, the latter immediately above the upper posterior angle of the eye. There is a wide space between the cavities of the third pair and the occipital crest, unoccupied by muciferous channels. The third and fourth pair are continued into the channels of the infraorbital bones and of the suprascapula. The præorbital is narrow, about three times as long as broad, and has four or five grooves. The turbinal bone is transformed into a half-channel of moderate length. There are four grooves between the ridges of the præoperculum; they are wide, not deep, and separated from one another by narrow bony cross-bars. Only the angle of the bone is distinctly serrated, the inferior limb exhibiting some obsolete denticulations; the posterior is entirely smooth. The operculum has a deep angular notch, and no prominent spines, nor a ridge on its interior surface; the suboperculum is slightly notched before the base of the pectoral fin; the suprascapula is entire.

The lower part of the skull is very much swollen, globular, with a narrow groove along the medial line.

The glossohyal is styliform, and rather broader anteriorly; the urohyal is an elongate triangular plate, with a groove along its inferior margin. The pubic bones have no posterior process, and are divergent anteriorly.

There are eleven abdominal and fifteen caudal *vertebræ*, the length of the former portion of the column being to that of the caudal as 1:1·26. The first interhæmal spine is rather strong, and equals the length of the second vertebra to the sixth.

2. Larimus breviceps.

Cuv. & Val. v. p. 146. pl. 111.

D. 9–10 | $\frac{1}{28\text{–}30}$. A. $\frac{2}{7}$. L. lat. 45. L. transv. 15. Cæc. pylor. 11. Vert. 10/15.

The height of the body is contained $3\frac{1}{2}$–$3\frac{2}{3}$ in the total length, the length of the head $4\frac{1}{3}$ times. The snout is equal to the width of the orbit; the lower jaw projecting beyond the upper. All the teeth villiform. The spinous dorsal is one-fourth higher than the soft; caudalis rhomboidal; the second anal spine nearly as long as the first ray. Back with narrow oblique streaks directed forwards, lateral bands more horizontal. The first dorsal blackish, with a triangular white spot before the base of each spine.

Brazil; S. Domingo.

a. Half-grown. S. Domingo. Purchased of M. Parzudaki.
b. Fine specimen. From Mr. Fraser's Collection.
c. Adult male: skeleton. From Mr. Fraser's Collection.

Skeleton.—The maxillary gradually widens from the base to its extremity, which is rather broad and obliquely truncated. The intermaxillary tapers to a point, and is armed with a very narrow band of minute teeth; its posterior processes extend backwards to the level of the anterior margin of the eye, being one-third of the length of the bone; there is a flat, low prominence in the middle of its posterior margin. The muciferous channel of the mandibula is rather deep, not divided by bony cross-bars, traces of which are scarcely visible. The anterior part of the vomer is excavated.

The bony ridges and crests on the upper surface of the skull are somewhat differently arranged from those of *Larimus auritus*. The occipital crest is not very elevated above the surface of the skull, and its horizontal portion is lower than its vertical; anteriorly it diverges into two ridges, forming two sides of a central cavity, which is elongate, quadrangular, with the anterior side half as long as the posterior. The other cavities are symmetrically arranged in pairs: the first corresponds to the turbinal bones, the second to the anterior portion of the frontal bones, and is situated between the upper anterior margin of the orbit and the anterior side of the central cavity; the third is large, and situated between the upper posterior margin of the orbit and the posterior side of the central cavity: the fourth is placed behind the orbit. There are several others which are less distinct, between the occipital crest and the scapula. The præorbital is rather narrow, not quite three times as long as broad, and has two series of grooves; the remainder of the infraorbital ring and the præoperculum are transformed into a half-channel, that of the latter being divided into four cavities by narrow, feeble cross-bars. The inferior præopercular limb is distinctly serrated, the posterior smooth. The other opercles are exceedingly thin and flexible; the operculum terminates posteriorly in two points, to each of which corresponds a feeble ridge on the interior surface of the bone. The scapula has the posterior margin fringed. Each pubic bone is formed by three lamellæ; they have no posterior process, and are divergent anteriorly.

The lower portion of the skull is globular, depressed, with a groove along the medial line. There are ten abdominal and fifteen caudal *vertebræ,* the length of the former portion of the vertebral column being to that of the latter as 1 : 1·8. The three anterior vertebræ have a longitudinal groove, formed by a pair of prominent ridges; the fourth is provided with a protuberance for the attachment of the air-bladder. The first interhæmal spine is strong, and its length equals that of the second vertebra to the ninth.

3. Larimus fasciatus.

Holbr. Ichth. S. Carol. p. 153. pl. 22. f. 1.

$$\text{D. } 10 \left| \tfrac{1}{24}. \right. \quad \text{A. } \tfrac{2}{6}. \quad \text{Cæc. pylor. 12.}$$

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head four times. The snout is shorter than the eye; the lower jaw projects beyond the upper. All the teeth villiform. Caudalis rounded; the second anal spine shorter than the first ray. Seven dusky vertical cross-bands descend from the back. (*Holbr.*)

Fresh waters of South Carolina.

4. Larimus dentex.

Corvina dentex, *Cuv. & Val.* v. p. 139. pl. 109.

$$\text{D. } 10 \left| \tfrac{1}{21-24}. \right. \quad \text{A. } \tfrac{2}{9}. \quad \text{Cæc. pylor. 7.}$$

The height of the body is $4\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{2}$; the diameter of the eye is $3\frac{2}{3}$ in the latter. The lower jaw scarcely longer than the upper; an external series of pointed teeth in both the jaws, and one or two canine-like in the lower. Præoperculum minutely crenulated. Caudalis truncated; the second anal spine three-quarters the length of the first ray, but rather feeble. The scales with specks, formed by minute brown dots.

Caribbean Sea.

a. Half-grown. From the Collection of the Zoological Society.
b. Half-grown. From the Haslar Collection.
c. Half-grown: skin. Jamaica. From Dr. Parnell's Collection.
d. Fine specimen. Trinidad. Presented by J. B. Richardson, Esq.
e. ? Adult: very bad state; has been in chloride of zinc. South America. From Mr. Bridge's Collection.

2. POGONIAS.

Pogonias, *Cuv. Règne Anim.*; *Cuv. & Val.* v. p. 196.

Body oblong; muzzle convex, with the upper jaw overlapping the lower. Pharyngeal teeth pavement-like. Mandibula with many barbels. Two dorsals, the first with ten stout spines; the anal fin with two, one of which is very strong. Scales moderate. Air-bladder with appendages. Pyloric cæca in small number.

Atlantic coasts of North America.

1. Pogonias chromis.

Labrus cromis, *L. Syst. Nat.* p. 479; *Schoepff, Schrift. Naturf. Freunde Berl.* viii. p. 158; *Jussieu, Mém. Acad. Sc.* 1723, p. 207. pl. 11 (pharyngeal teeth).
Sciæna chromis, *Bl. Schn.* p. 82; *Lacép.* iv. p. 314.
Pogonathus courbina, *Lacép.* v. p. 121.
Sciæna gigas, *Mitch. Trans. Lit. & Phil. Soc. New York,* i. p. 412. pl. 5. f. 10.
—— fusca, *Mitch. l. c.* p. 409.
Pogonias chromis, *Cuv. & Val.* v. p. 206; *Dekay, New York Fauna, Fishes,* p. 80; *Holbr. Ichth. S. Carol.* p. 112. pl. 16. f. 2 (fins not good); *Cuv. Règne Anim. Ill. Poiss.* pl. 29. f. 1.

D. 10 $\left| \frac{1}{22} \right.$. A. $\frac{2}{7}$. L. lat. 43. L. transv. $\frac{9}{13}$. Cæc. pylor. 8.
Vert. 10/14.

Caudalis truncated; the length of the pectoral about one-fourth of the total. Mandibula with about twenty barbels. Uniform brownish-grey; axil with a black spot.

Coasts of North America from New York to Cape Florida, and probably more towards the south.

a. Stuffed: 37 inches long and 10½ high. North America. Presented by Edward Doubleday, Esq.
b. Adult skin. Pontchartrain Lake. From Dr. Parnell's Collection.
c. Pharyngeal teeth of specimen *a*.

2. Pogonias fasciatus.

Pogonias fasciatus, *Lacép.* iii. p. 137; *Cuv. & Val.* v. p. 210. pl. 118; *Wilson, Encycl. Brit. Ichth.* p. 176. pl. 296. f. 13; *Dekay, New York Fauna, Fishes,* p. 81. pl. 14. f. 40: *Holbr. Ichth. S. Carol.* p. 118. pl. 16. f. 1.
Labrus grunniens, *Mitch. Trans. Lit. & Phil. Soc. New York,* i. p. 405. pl. 3. f. 3.

D. 10 $\left| \frac{1}{22} \right.$. A. $\frac{2}{7}$. Cæc. pylor. 6.

Caudalis truncated; the length of the pectoral about one-fifth of the total. Mandibula with about twenty barbels. Body with four dusky cross-bands on each side.

American coasts from Rhode Island to Cape Florida.

3. MICROPOGON.

Micropogon, *Cuv. & Val.* v. p. 213.

Body oblong; muzzle convex, with the upper jaw overlapping the lower; mandibula with several minute barbels. Pharyngeal teeth pointed, conical. Two dorsals, the first with ten slender spines, the anal with two, one of which is moderately strong. Scales moderate, ctenoid. Pseudobranchiæ; the air-bladder with elongate horns. Pyloric appendages in small number.

Atlantic coasts of the New World, entering fresh waters. Chile?

1. Micropogon undulatus.

Catesby, Carol. ii. p. 3. tab. 3. f. 1.
Perca undulata, *L. Syst. Nat.* p. 483; *Bl. Schn.* p. 87.
Sciæna croker, *Lacép.* iv. pp. 309, 314, 316.
—— opercularis, *Quoy & Gaim. Voy. Uran. Zool.* p. 347.
Micropogon undulatus, *Cuv. & Val.* v. p. 219; *Dekay, New York Fauna, Fishes,* p. 84; *Holbr. Ichth. S. Carol.* p. 145. pl. 21. f. 1.
—— lineatus, *Cuv. & Val.* v. p. 215. pl. 119; ? *Gay, Hist. Chil. Zool.* ii. p. 193.
—— argenteus, *Cuv. & Val.* v. p. 218.

D. $10 \left| \frac{1}{27\text{–}30} \right.$. A. $\frac{2}{8}$. L. lat. 55. L. transv. $\frac{7}{18}$. Cæc. pylor. 8–9. Vert. 10/15.

The upper jaw convex, overlapping the lower; the upper maxillary reaches a little behind the anterior margin of the eye; præoperculum denticulated, with two rather strong spinous teeth at the angle. Caudalis truncated; the second anal spine moderately strong, one-third the length of the head. Dorsal fins greyish, with or without spots; a black spot above the axil; body with more or less oblique streaks.

Atlantic coasts of the New World, entering fresh waters.

The structure of the air-bladder is known: cfr. *Cuv. & Val.* v. p. 216, and *Siebold & Stannius, Zoot. Fische,* pp. 227, 228.

a. Large specimen. Surinam. Purchased of Mr. Frank.
b. Adult. Bahia. Purchased of M. Parzudaki.
c. Adult. Guatemala. Purchased of Mr. Frank.
d. Adult. Cuba. From the Collection of the Zoological Society.
e, f. Half-grown: skins. Jamaica. From Dr. Parnell's Collection.
g. Adult: skin. New York. From Dr. Parnell's Collection.
h. Adult. From the Haslar Collection.
i. Adult: skeleton. From the Haslar Collection.
k, l. Half-grown. Old Collection.
m. Air-bladder of specimen *i.*

Skeleton.—Two portions may be distinguished in the *maxillary* bone: the basal portion with two articular cavities, as in *Sciæna amazonica,* and the external part of the bone, which, moderately broad from its origin, is not very much widened at its opposite extremity; there are no vestiges of its having been separated into two bones. The *intermaxillary* is strong, but narrow, and much shorter than the maxillary; it has a flat, short posterior prominence at its extremity; the posterior processes are exceedingly broad, twice as broad as the bone itself, and reach as far backwards as the turbinal bones, which, thin and excavated, do not fully extend to the level of the anterior margin of the orbit. The anterior part of the *vomer* is slightly concave and porous, and terminates in an exceedingly narrow, styliform posterior part. The muciferous channel of the *mandibula* is divided by very delicate transverse bones into three large cavities and several small ones near the symphysis. The *hypotympanic* is joined to the *prætympanic* by a narrow strip of cartilaginous tissue, the other tympanic bones being joined together by more or less distinct sutures. The *mesotympanic* is very small and narrow, without foramen. There is a small cavity, closed by a membrane only, between the *præ-* and *epitympanic*, and the latter exhibits immediately behind that cavity a slightly curved ridge, surrounding one-half of a rather wide foramen. The *pterygoid* is triangular, and extends to the mandibulary joint; it touches the entopterygoid by one of its angles, without forming a linear suture with it. The *entopterygoid* is formed by a moderately strong osseous strip along the suture with the palatine bone, all the rest being thin and fragile, like the adjacent part of the prætympanic. The *palatine* bone has a triangular shape, and has one of its sides free.

The upper surface of the skull is entirely occupied by deep and wide cavities, separated from one another by more or less thin bony bars. The occipital crest is formed as in *Sciæna amazonica*, but there are no cavities in the *supraoccipital*; the cavities, too, have a more or less different form. The occipital crest bifurcates, and emits two bars, to form the central and largest cavity: this cavity is elongate, quadrangular, with two pairs of sides, with a posterior acute angle and a very obtuse one in front, and with the lateral ones slightly exceeding a right angle: the posterior pair of the sides is at least three times as long as the anterior. There are five other cavities besides, on each lateral half of the upper surface of the skull (several small ones not included which are situated on, or near, the suprascapula):—

1. A pentagonal cavity between the central cavity and the upper margin of the orbit.
2. A pentagonal cavity between the former and the posterior infraorbital bone: there is another small one attached to it, intermediate between the præopercular channel and the frontal cavities.
3. An oblong, quadrangular cavity between the central cavity and the turbinal bone.
4. An irregularly half-cylindrical cavity, formed by the turbinal bone.
5. An incomplete cavity, situated at the side of the occipital crest, and behind the cavity described under no. 1.

The *infraorbital* arch is composed of six broad, thin bones, with a stronger orbital ridge, from which radiate other transverse bars, dividing the infraorbital channel into as many cavities. This channel has the same relation to other parts of the muciferous system as in *Sciæna amazonica*. The first and second infraorbitals apparently form one single bone with five or six cavities; the third has two transverse bars, the posterior ones severally one. The structure of the *præopercular* channel is the same as in the other species mentioned, but two of the bars are rather strong, and terminate in two prominent spines at the angle of the præoperculum. There are about nine spinous teeth along the posterior limb, gradually becoming smaller at the upper part of the margin. The *operculum* has a very deep and semicircular notch posteriorly, between two points, the upper of which is obtuse; the lower is slightly prominent, and forms the termination of a slight crest at the interior side of the operculum. The *inter-* and *suboperculum* are elongate.

The *suprascapula* has several thin bony bars, forming four or five more or less regular cavities; a part of its posterior margin is indistinctly denticulated. The other bones of the humeral arch do not differ from those of *Sciæna amazonica*.

The base of the skull is very much swollen and globular, as in the other *Sciænidæ*.

There are ten abdominal and fifteen caudal *vertebræ*, the length of the former portion of the column being to that of the caudal as 11 : 20. The first four vertebræ are much more voluminous than the following; the fifth has a pair of prominent longitudinal ridges, with deep lateral grooves (at the abdominal surface); the abdominal surface of the sixth is concave; the hæmal spines form a closed arch from the seventh vertebra. The ribs of the third, fourth, and fifth are broader than the others. Epipleurals well developed. The first interhæmal is of moderate strength, composed of three ridges, as long as the first eight vertebræ together, and attached to the hæmals of the eleventh and twelfth vertebræ.

The *dentition* is formed by villiform bands, and there is an outer series of rather longer teeth in the upper jaw. The teeth of the lower pharyngeal bones are partly cardiform, those of the upper partly villiform, partly conical molars.

2. Micropogon trifilis.

Müll. & Trosch. in Schomb. Reis. Brit. Guyana, iii. p. 622.

D. $10 \mid \frac{1}{26}$. A. $\frac{2}{6}$. L. lat. 50.

Only three minute barbels under the chin. Snout swollen, without any pores or lobes; the diameter of the eye is one-third of the length of the head, and one-half larger than the interspace between the eyes. Caudalis rhomboidal; the second anal spine nearly as long as the first soft ray. (*M. & T.*)

Coast of Guiana.

4. UMBRINA*.

Umbrina, *Cuv. Règne Anim.*; *Cuv. & Val.* v. p. 171.

Body oblong; muzzle convex, with the upper jaw overlapping the lower; a short barbel under the mandibular symphysis. Two dorsals, the first with nine or ten flexible spines; the anal fin with one or two. Scales moderate; pseudobranchiæ. The air-bladder with* or without appendages or absent†. Pyloric cæca in small number.

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* 1. Umbrina undulata, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 148, and *U. S. Pacif. R. R. Exped. Fishes*, p. 101.—California.

2. —— phalæna, *Girard, Proc. Acad. Nat. Sc. Philad.* 1858, p. 167.—Texas.

Mediterranean, Atlantic, and Indian Seas; rivers of North and South America

1. Umbrina cirrhosa.

Glaucus, *Bellon.* i. p. 103. fig. in p. 105; *Gesner, Aquat.* iv. p. 390.
Chromis, *Bellon.* i. p. 106. fig. in p. 107; *Gesner, Aquat.* iv. p. 224.
Umbra, *Rondel.* i. lib. v. p. 132; *Gesner, Aquat.* p. 1030; *Willughby,* iv. p. 299. tab. S. 21.
Coracinus, *Salviani,* p. 117. f. 34; *Aldrov.* i. p. 72.
Sciæna, sp. 1, *Artedi, Synon.* p. 65, *Gen.* p. 38; *Gronov. Zoophyl.* n. 212.
—— cirrhosa, *L. Syst. Nat.* i. p. 481; *Bl.* tab. 300.
Johnius cirrhosus, *Bl. Schn.* p. 76.
Perca umbra, *Lacép.* iii. p. 16; *Risso, Ichth. Nizza,* p. 297.
Chilodipterus cyanopterus, *Lacép.* iii. p. 546. pl. 6. f. 3.
Coracinus boops, *Pall. Zoogr.* iii. p. 259.
Umbrina cirrhosa, *Cuv. Règne Anim.*; *Risso, Hist. Nat.* iii. p. 409; *Bonap. Faun. Ital.* p. . pl. . f. 3; *White, Catal. Brit. Fishes,* p. 15.
—— vulgaris, *Cuv. & Val.* v. p. 171; *Yarrell, Brit. Fishes,* i. p. 109; *Nordm. in Demid. Voy. Russ. Mérid. Zool.* p. 383. pl. 3. f. 2; *Cuv. Règne Anim. Ill. Poiss.* pl. 28. f. 3.
Sciæna cestreus, *Gronov. Syst. ed. Gray,* p. 52.
Skeleton: *Agassiz, Poiss. Foss.* iv. p. 178. tab. K (Sciæna cirrhosa).

D. $10 \mid \frac{1}{22-23}$. A. $\frac{2}{7}$. L. lat. 65. L. transv. 28. Cæc. pylor. 10. Vert. 11/14.

Barbel very short. The height of the body equals the length of the head, and is one-fourth of the total; the diameter of the eye is one-fourth of the length of the head. Præoperculum rectangular, with the posterior limb denticulated (in young individuals); suprascapula serrated. Caudalis truncated; the ventral fins a little longer than the pectorals. Narrow, oblique, black-edged streaks descending forwards from the back; the extremity of the operculum black; the first dorsal and caudal fins blackish.

Mediterranean; (coast of England?;) Cape Seas.

a. Young: skin. From Mr. Yarrell's Collection.
b. 27 inches long: stuffed. Algoa Bay. From the Collection of the Zoological Society.
c. Adult: skin. From Gronow's Collection.

2. Umbrina canariensis.

Valenc. in Webb & Berthelot, Hist. Nat. Iles Canar. Ichth. p. 24.

D. $10 \mid \frac{1}{29}$. A. $\frac{2}{7}$. L. lat. 45.

Barbel very short. The height of the body is nearly equal to the length of the head, and $4\frac{1}{2}$ in the total. The diameter of the eye equals the extent of the snout, and is one-third of the length of the head. Præoperculum serrated, with stronger denticulations at the angle. Caudalis truncated; the second anal spine strong. Brownish-green, with fifteen or twenty oblique bluish streaks on each side; fins brownish. (*Val.*)

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* In Indian species.

† Without appendages or absent: in American species.

Canaries.

3. Umbrina ronchus.

? *Valenc. in Webb & Berthelot, Hist. Nat. Iles Canar. Ichth.* p. 24.

D. $10 \Big| \frac{1}{29\ (25\ Val.)}$. A. $\frac{2}{7}$. L. lat. 60. L. transv. $\frac{7}{15}$.

Barbel very short. The height of the body is $3\frac{1}{2}$ in the total length, the length of the head four times; the diameter of the eye is $4\frac{1}{2}$ in the length of the head. Præoperculum rectangular, with stronger denticulations at the angle; suprascapula serrated. Caudalis truncated; the ventral and pectoral fins equal in length; the second anal spine strong, its length being $2\frac{1}{2}$ in that of the head. Uniform brown, golden-shining.

Sea of Madeira.

a. Fine specimen (16 inches long). Madeira. Presented by the Rev. R. T. Lowe.

4. Umbrina alburnus.

Alburnus americanus, *Catesb. Hist. Nat. Carol.* ii. p. 12. pl. 12. f. 2.
Perca alburnus, *L. Syst. Nat.* p. 482; *Bl. Schn.* p. 87; *Schoepff in Schrift. Naturf. Freunde Berlin*, viii. p. 162.
Centropomus alburnus, *Lacép.* iv. pp. 249, 257, 264.
Sciæna alburnus, *Gronov. Syst. ed. Gray*, p. 51 *.
Umbrina alburnus, *Holbr. Ichthyol. S. Carol.* p. 136. pl. 20. f. 2.

D. $10 \Big| \frac{1}{24\text{-}26}$. A. $\frac{1}{8}$. Cæc. pylor. 7.

Barbel short, not half the width of the eye. The height of the body is $4\frac{2}{3}$ in the total length, the length of the head $4\frac{1}{3}$; the diameter of the eye is $7\frac{1}{2}$ in the length of the head, and $2\frac{1}{2}$ in that of the snout. Præoperculum without distinct denticulations; suprascapula serrated. The third dorsal spine shorter than the head. Caudalis obliquely truncated; the anal spine very feeble. Seven oblique dusky bands descend from the back to below the lateral line; they are sometimes interrupted and appear as irregular *blotches*. Fins more or less translucent. No air-bladder.

Shores of the United States, south of Cape Hatteras.

a. Adult: skin. From Gronow's Collection.

5. Umbrina nebulosa.

Sciæna nebulosa, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. 1815, p. 408. pl. 3. f. 5.
Umbrina alburnus, *Cuv. & Val.* v. p. 180; *Dekay, New York Fauna, Fishes*, p. 78. pl. 7. f. 20; *Baird, Ninth Smithson. Report*, p. 331.

D. $10 \Big| \frac{1}{25}$. A. $\frac{1}{8}$. L. lat. 98. L. transv. $\frac{8}{18}$. Cæc. pylor. 9.
Vert. 11/14.

Barbel short, not half the width of the eye. The height of the body is $4\frac{2}{3}$ in the total length, the length of the head $4\frac{1}{3}$; the diameter of the eye is $7\frac{1}{2}$ in the length of the head, and $2\frac{1}{2}$ in that of the snout. Præoperculum with the posterior limb nearly vertical, and furnished with distinct, nearly equal denticulations. Suprascapula serrated. The third dorsal spine very elongate, in some individuals equal to the length of the head, in others one-third of the total length. Caudalis obliquely truncated; the anal spine very feeble. An oblique dark band from the nape to the side of the body, directed backwards; three oblique dark bands from the back to the side, directed forwards; a dark longitudinal band along the middle of the tail; all the fins more or less blackish. Pseudobranchiæ. No air-bladder.

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* "Maxilla inferior imberbis:' probably copied from Linné.

Shores of the United States, north of Cape Hatteras.

a. Adult. New York. Purchased of Mr. Brandt.
b. Half-grown. New York. Purchased of Mr. Brandt.
c. Adult. N. America. Purchased of Mr. Warwick.
d. Adult. N. America. Purchased of Mr. Warwick.

6. Umbrina arenata.

Cuv. & Val. v. p. 190; *Jenyns, Zool. Beagle, Fishes,* p. 44.

$D.\ 10 \mid \frac{1}{22-25}. \quad A.\ \frac{1}{7-8}.$ L. lat. 73–78.

Barbel short. The height of the body is $4\frac{2}{3}$ or 5 in the total length, the length of the head $3\frac{1}{2}$ or 4; the diameter of the eye is seven to ten times in the length of the head. In the upper jaw an external series of larger teeth. Denticulations of præoperculum inconspicuous. The third dorsal spine three-fifths of the length of the head; caudalis with an oblique notch; the anal spine feeble. All the parts with minute brown dots.

Atlantic coasts of Tropical America.

a. Adult. Gulf of Mexico. From the Haslar Collection.
b. Adult: skin. Jamaica. From Dr. Parnell's Collection.

7. Umbrina littoralis.

Holbr. Ichthyol. S. Carol. p. 142. pl. 20. f. 1.

$D.\ 10 \mid \frac{1}{27}. \quad A.\ \frac{1}{9}.$ Cæc. pylor. 10.

Barbel short, not half the width of the eye. The height of the body is $4\frac{2}{3}$ in the total length, the length of the head $4\frac{1}{3}$; the diameter of the eye is $7\frac{1}{2}$ in the length of the head, and $2\frac{1}{2}$ in that of the snout. No larger teeth in the external row of the upper jaw. The third dorsal spine shorter than the head; the anal spine very feeble. Silvery-white, immaculate. No air-bladder.

Coast of South Carolina.

8. Umbrina broussonnetii.

? Petoto, *Humboldt, Observ. Zool.* ii. p. 189.
Umbrina broussonnetii, *Cuv. & Val.* v. p. 187.
—— coroides, *Cuv. & Val. l. c.* pl. 117.

D. 10 | $\frac{1}{26-29}$. A. $\frac{2}{6-7}$. L. lat. 48. L. transv. $\frac{5}{10}$.

Barbel very short. The height of the body is $3\frac{3}{4}$ in the total length, the length of the head four times. The diameter of the eye is $4\frac{1}{2}$ in the length of the head and $1\frac{1}{2}$ in that of the snout. The upper maxillary reaches to the anterior margin of the orbit. Præoperculum with distinct denticulations, those of the angle not much larger. The first dorsal not elevated; caudalis truncated; the second anal spine thick, one-third of the length of the head. The first dorsal blackish; body with nine dark cross-bands.

Atlantic coasts of Tropical America.

a. Fine specimen. S. Domingo. Purchased of Mr. Cuming.
b–d. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
e. Half-grown: skin. Jamaica. From Dr. Parnell's Collection.
f, g. Adult: skins. West Indies. Purchased of Mr. Scrivener.

9. Umbrina martinicensis.

Cuv. & Val. v. p. 186.

D. 10 | $\frac{1}{24}$. A. $\frac{1}{10}$.

Barbel short, not half the width of the eye. The height of the body is about one-fifth of the total length, the diameter of the eye about one-seventh of the length of the head. The upper jaw with an external row of larger teeth. Præoperculum very distinctly denticulated. The third dorsal spine shorter than the head; the anal spine very feeble. Uniform brownish.

Martinique.

10. Umbrina gracilis.

Cuv. & Val. v. p. 189.

D. 10 | $\frac{1}{19}$. A. $\frac{1}{7}$. L. lat. 75.

Barbel short. The height of the body less than one-fourth of the total length. Caudal slightly emarginate, with unequal lobes. Coloration uniform. (*Cuv.*)

Brazil.

11. Umbrina ophicephalus.

Jenyns, Zool. Beagle, Fishes, p. 45, cop. by *Gay, Hist. Chil. Zool.* ii. p. 189, *Atl. Ictiol.* lam. 3 bis, f. 1*.

D. 12 | $\frac{1}{22}$. A. $\frac{1}{9}$.

Barbel very short. The height of the body is one-sixth of the total length, the length of the head one-fifth. Dorsal line nearly straight. The snout is very blunt, as long as the diameter of the eye, one-fifth the length of the head. Præoperculum very obsoletely denticulated. The anal spine very slender, and about half the length of the first ray. Coloration uniform.

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* This figure appears to be very bad, not only not agreeing with the descriptions quoted, but even omitting characters, as the anal spine, &c.

Coquimbo, Chile.

12. **Umbrina dussumieri.**

Cuv. & Val. ix. p. 481; *Bleeker, Verh. Bat. Gen.* xxiii. *Sciæn.* p. 19.

D. $10 \mid \frac{1}{24}$. A. 2/7. L. lat. 51. L. transv. $\frac{7}{19}$.

The height of the body is $3\frac{4}{5}$ in the total length, the length of the head $3\frac{3}{4}$; the diameter of the eye is $4\frac{2}{3}$ in the length of the head, and much shorter than the snout; the upper maxillary reaches to below the centre of the orbit. Præoperculum rounded, without visible denticulations; the second anal spine moderate, its length being $3\frac{1}{2}$ in that of the head. Coloration uniform (in spirits): the first dorsal greyish.

East Indies.

a. Half-grown. Sine patria.

13. **Umbrina amblycephalus.**

Bleeker, Amboina, vi. p. 412.

D. $10 \mid \frac{1-2}{24}$. A. $\frac{2}{7}$. L. lat. 53.

Barbel shorter than the eye. The height of the body is nearly equal to the length of the head, and $4\frac{1}{2}$ in the total. The diameter of the eye is nearly one-third of the length of the head. The upper maxillary reaches to below the posterior half of the eye; the upper jaw with an external series of larger teeth. Præoperculum rounded, distinctly denticulated. Caudalis with an oblique notch; the second anal spine thick, shorter than the first ray. Coloration uniform. (*Bl.*)

Sea of Amboyna.

14. **Umbrina russellii.**

Russell, pl. 118 (not finished figure).
Umbrina russelli, *Cuv. & Val.* v. p. 178; ? *Richards. Ichth. Chin.* p. 226; *Cant. Catal.* p. 71.
—— kuhlii, *Cuv. & Val.* v. p. 179; *Bleek. Verhand. Batav. Genootsch.* xxiii. *Sciæn.* p. 19.

D. $10 \mid \frac{1-2}{27-26}$. A. $\frac{2}{7}$. L. lat. 50.

Barbel elongate, reaching to the angle of the mouth; shorter in young individuals. The height of the body is $3\frac{2}{3}$ in the total length, the length of the head $4\frac{1}{5}$. The snout equals in length the diameter of the eye, which is one-fourth of the length of the head. Caudalis rhomboidal; the second anal spine four-fifths of the length of the first ray. Silvery greyish-green: from the vertex, between the eyes, a blackish band runs obliquely backwards over the temple, terminating on the opercle in a large steel-blue spot; nape with a broader black band running obliquely downwards to the origin of the lateral line; the first dorsal blackish. *Adult* paler, with the bands inconspicuous, but with oblique streaks on the back.

Vizagapatam. Indian Seas. China Seas?

a–c. Half-grown: skins. Malayan Peninsula. From Dr. Cantor's Collection.

15. Umbrina macroptera.

Bleeker, Sumatra, ii. p. 12.

$$\text{D. } 10 \left| \tfrac{1}{30}. \right. \quad \text{A. } \tfrac{2}{7}. \quad \text{L. lat. } 48.$$

Barbel not half as long as the width of the orbit. The height of the body is nearly equal to the length of the head, and about $4\frac{2}{3}$ in the total; the diameter of the eye is 4 to $4\frac{1}{2}$ in the length of the head. Præoperculum rounded, distinctly denticulated. The pectoral fins longer than the ventrals; caudalis rhomboidal. Grey, densely covered with minute black dots.

Sea of Priaman (Sumatra).

5. EQUES.

Eques, *Bl. Schn.* p. 105; *Cuv. & Val.* v. p. 163.

Body oblong, with the nape and the first dorsal elevated; the upper jaw overlapping the lower; eye moderate. Two dorsals: the first very elevated, with the number of spines variable (10–16), the anal spines feeble; the second dorsal very long, and covered with thin scales, like the caudal. Scales moderate. Air-bladder without appendages. Pyloric cæca in small number. Pseudobranchiæ.

Atlantic coasts of Tropical America.

1. Eques lanceolatus.

Edwards, pl. 210 (fig. media), cop. by *Duhamel, Pêches,* ii. pl. 7. f. 9; *Parra,* pl. 2. f. 2.

Chætodon lanceolatus, *L. Gm.* p. 1254.

Eques americanus, *Bl.* taf. 347. f. 1; *Bl. Schn.* p. 105.

—— balteatus, *Cuv. & Val.* v. p. 165; *Cuv. Règne Anim. Ill. Poiss.* pl. 29. f. 2.

Sciæna edwardi, *Gronov. Syst. ed. Gray,* p. 53.

—— lanceolatus, *Casteln. Anim. nouv. ou rares de l'Amér. du Sud,* p. 10.

$$\text{D. } 16 \left| \tfrac{1}{53}. \right. \quad \text{A. } \tfrac{2}{10}. \quad \text{L. lat. } 60. \quad \text{Cæc. pylor. } 4. \quad \text{Vert. } 10/15.$$

The first dorsal as high as the body below. Greyish-yellow, with three broad blackish-brown bands, edged with whitish: the first, vertical, from the crown through the eye to the angle of the mouth; the second, slightly arched, from the nape over the opercle to the base of the ventral; the third, curved, from the top of the first dorsal, along the middle of the side of the body to the root of the caudal fin.

Caribbean Sea.

a. Adult. America.

b. Adult. America.
c. Adult: stuffed. West Indies. Purchased of Mr. Scrivener.
d. Half-grown.
e. Adult: skeleton. From the Collection of the Zoological Society.
f. Intestines of specimen *c.*

The *air-bladder* is oblong, with rather thin membranes, without any appendages or contractions; in front it is obtuse, rounded, tapering to a point behind. The peritoneum forms a similar sac round the intestines, as in *Sciæna lucida*, with a very firm structure, so that it is not easily torn; but there are no air-vessels between the laminæ forming this sac.

The *skeleton* differs in several points from that of other *Sciænidæ.* The occipital crest is very elevated, and the horizontal portion of it is much wider than the vertical; it is continued nearly to the anterior extremity of the frontal bones, there being no single central cavity, but on each side of the crest three grooves, separated from one another by broad bony bridges. The anterior part of the infraorbital arch is broad, and has two rows of grooves. The arrangement of the remainder of the muciferous channels is the same as in *Sciæna amazonica.* The upper maxillary gradually widens posteriorly, but it is not very broad at its extremity. The teeth form broad villiform bands, without larger ones. The lower part of the skull globular; the occipital without cavities at the base of the crest. Urohyal short, high, and triangular. Clavicula with an anterior hook-like process. Ten abdominal and fifteen caudal *vertebræ*, the caudal portion being nearly twice as long as the abdominal. All the vertebræ are very compressed. It is a remarkable peculiarity of these fishes, observed also by Cuvier, that all the interneural spines of the spinous dorsal are fixed between the neurals of the second and third vertebræ. Cuvier, who examined the skeleton of *Eques punctatus*, found them between the third and fourth. Nevertheless, these neural spines are not much stronger than the following. Two of the interneurals of the soft dorsal fin are always attached to one neural; and one or two, and posteriorly even more, are intermediate, without being connected with any of the neurals. The first interhæmal is of moderate strength, equal in length to that of the third to eighth vertebræ, and attached to the hæmals of the eleventh, twelfth and thirteenth.

2. Eques acuminatus.

Seba, iii. pl. 26. f. 33.
Grammistes acuminatus, *Bl. Schn.* p. 184.
Eques lineatus, *Cuv. & Val.* v. p. 169.
—— acuminatus, *Casteln. Anim. nouv. ou rares de l'Amér. du Sud*, p. 10.

D. $10 \left| \frac{1}{38\text{–}40} \right.$. A. $\frac{2}{7}$. Vert. 11/14.

With six or seven straight longitudinal bands.

Atlantic shores of Tropical America.

a. Adult. Cuba. From the Collection of the Zoological Society.

3. Eques punctatus.

Parra, pl. 2. f. 1.

Eques punctatus, *Bl. Schn.* p. 106. pl. 3. f. 2 (cop.); *Cuv. & Val.* v. p. 167. pl. 116.

D. 11 | $\frac{1}{46}$. A. $\frac{2}{7}$. Cæc. pylor. 7*. Vert. 11/14.

The first dorsal as high as the body below. Brown: sides of the head with two vertical bands; sides of the body with curved bands, running from the back to the root of the caudal fin. The vertical fins with bluish-white spots.

Caribbean Sea.

a. Adult. From the Collection of the Zoological Society.
b. Adult: stuffed. Caribbean Sea. Purchased of Mr. Warwick.
c. Adult: stuffed. Caribbean Sea. Purchased of Mr. Scrivener.
d. Adult: stuffed.
e–g. Adult: skins. Jamaica. From Dr. Parnell's Collection.

6. PACHYURUS.

Pachyurus, *Agass. in Spix, Pisc. Bras.* p. 123.

Lepipterus, *Cuv. & Val.* v. p. 151.

Body oblong; muzzle with the jaws nearly equal in front; eye moderate. Two dorsals, the first with ten spines; one of the anal spines strong. The second dorsal and caudal fins densely covered with scales. All the teeth villiform. Præoperculum distinctly denticulated. Scales moderate, or rather small. Air-bladder? Pseudobranchiæ (*P. schomburgkii*).

South America.

1. Pachyurus squamipinnis.

Pachyurus squamipennis, *Agass. in Spix, Pisc. Bras.* p. 123. tab. 71.

D. 10 | 36. A. $\frac{2}{9}$. V. 1/5. L. lat. 96.

The second dorsal and caudal fins densely covered with small scales to their extremity. Caudalis rounded; the second anal spine very thick and strong, its length being $2\frac{2}{3}$ in that of the head; the head is one-fourth of the total length; the diameter of the eye one-seventh of the length of the head; the first dorsal spotted with brown.

Atlantic Ocean.

a. Nineteen inches long: stuffed: not good state.

2. Pachyurus francisci.

Lepipterus francisci, *Cuv. & Val.* v. p. 152. pl. 113.

D. 10 | $\frac{1}{33}$. A. $\frac{2}{7}$. V. 1/5.

Caudalis rounded; the second anal spine very thick and strong, its length being $2\frac{2}{3}$ in that of the head. The length of the head is one-fourth of the total, the height of the body one-sixth. The dorsal fins with brown spots.

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* Cuvier gives as a character of the genus, four pyloric appendages (p. 165), but in the description of this species (p. 168) he says that he has found seven.

River St. François (Brazil).

3. Pachyurus schomburgkii.

$$\text{D. } 10 \left| \frac{1}{26}. \quad \text{A. } \frac{3}{7}. \quad \text{L. lat. } 85. \quad \text{L. transv. } 9/20.\right.$$

The height of the body is $4\frac{1}{2}$ in the total length, the length of the head four times; the diameter of the eye is nearly one-fourth of the latter. The second dorsal covered with scales for three-quarters of its height, the caudal densely scaly. The second anal spine of moderate strength, shorter than the rays, one-third of the length of the head. Body and the second dorsal with blackish spots.

Rivers of Brazil.

a. Fine specimen. River Capin (Para). Purchased of Mr. Stevens.
b. Young. Caripe Para. Presented by J. R. Smith, Esq.

Description.—The body is slightly compressed and somewhat elongate, its greatest height being above the base of the ventral fins, and contained $4\frac{1}{2}$ in the total length. The head is conical, elongate, with the snout produced and somewhat pointed. The space between the eyes is slightly convex, and as wide as the diameter of the eye, which is one-fourth of the length of the head, and $1\frac{2}{3}$ in that of the snout. The snout has a peculiar conical appearance, from the præorbital being swollen and so enlarged, that the maxillary and intermaxillary are entirely hidden. The upper jaw is slightly longer than the lower, which projects neither on the sides nor in front, so that the mouth itself is situated at the under surface of the skull; the cleft of the mouth is rather small, and the posterior extremity of the maxillary is at some distance from the level of the anterior margin of the eye. Transparent scales, larger than those of the body, cover the præorbital, the cheek, and the præoperculum, and extend on the upper surface of the skull before the nostrils. The nostrils are situated before the middle of the eye; they are close together, and nearly of equal size; the aperture of the posterior is partly covered by a small membranaceous lobule. The eye is much longer than high, elliptical, which, together with the transparent and swollen præorbital, gives a very peculiar physiognomy to this fish; it is rather nearer the top of the snout than the end of the operculum. The præoperculum is armed with spinous teeth of moderate size throughout; the posterior limb descends obliquely backwards, and is shorter than the inferior; the angle is rounded. Operculum without spine, and covered with scales smaller than those of the præoperculum.

The first dorsal begins above the root of the pectoral with a minute spine, and terminates above the extremity of that fin, where it is continued into the soft dorsal; and according to Cuvier's distinction between the single and double dorsal, this fish, like many other true *Sciænidæ*, would belong rather to *Pristipoma*, than to his group with two dorsals. The second spine of the dorsal fin is shorter than the two following, which are the longest, and three-fifths of the height of the body. The following spines decrease in length to the tenth, which is one-third of the longest. All the spines are very slender and flexible. The soft dorsal gradually becomes lower behind, and has a straight upper margin; the length of its base is 3½ in the total length; it is much lower than the spinous portion, and covered with scales for three-quarters of its height. The distance between the dorsal and caudal fins about equals the height of the tail below the end of the former. The middle rays of the caudalis are prolonged, the upper lobe being more angular, the lower more rounded; all the fin is thickly enveloped by scales. The base of the anal fin is situated vertically below the third quarter of the soft dorsal; the first spine is very small; the second of moderate strength, shorter than the first ray, and one-third of the length of the head. The soft portion is lower than the second dorsal, and without any scales. The pectoral is pointed, and its length one-sixth of the total; the ventral is inserted behind the pectoral, and rather shorter, its length being 6½ in the total. The spine is moderate, compressed, flexible at the tip, and two-thirds of the length of the first ray. The first ray is produced into a short filament, but is distant from the vent.

The scales are rather small, somewhat higher than long, and very finely ciliated; one of the largest covers one-fifth of the eye. The lateral line is slightly curved, and not continued on the caudal fin.

The *teeth* are minute and scarcely perceptible in the upper jaw; in the lower they form a fine villiform band.

	inches.	lines.
Total length	9	4
Height of the body	2	1
Length of the head	2	5
Longitudinal diameter of the eye	0	7½
Vertical diameter of the eye	0	5½
Length of the third dorsal spine	1	3½
Length of the second dorsal ray	1	0
——— of the caudal fin	1	8
——— of the second anal spine	0	9
——— of the first anal ray	0	11
——— of the pectoral	1	7
——— of the ventral	1	5
——— of the base of the spinous dorsal	1	6
——— of the base of the soft dorsal	2	9
——— of a large scale	0	2
Height of a large scale	0	2⅓

7. SCIÆNA[*].

Sciæna, sp., (*Artedi*) *Cuv. Règne Anim.*; *Cuv. & Val.* v. p. 28.
Johnius, *Bl. Schn.* p. 74; *Cuv. & Val.* v. p. 115.
Leiostomus, *Cuv. & Val.* v. p. 140.
Homoprion, *Holbr. Ichth. S. Carol.* p. 168.

Body oblong; eye of moderate size; the space between the eyes moderately broad and slightly convex; muzzle convex, with the upper jaw overlapping the lower or with the jaws equal in length, and with the cleft of the mouth horizontal, or slightly oblique. The outer series of the jaws generally contains larger teeth; never large canines. No barbel. The second spine of the anal more or less indistinct. Pseudobranchiæ; air-bladder with appendages. Pyloric appendages in small number.

Mediterranean; Atlantic; East Indian Seas; coast of California; fresh waters of North and South America.

1. Sciæna amazonica.

Johnius amazonicus, *Castelnau, Anim. nouv. ou rares de l'Amér. du Sud, Poiss.* p. 12. pl. 4. f. 1.

D. $10 \left| \frac{1}{33\text{–}34} \right.$. A. $\frac{2}{6}$. L. lat. 100[†]. L. transv. $\frac{12}{20}$. Vert. 12/13.

The height of the body is four times in the total length, the length of the head $3\frac{2}{3}$; the diameter of the eye is one-sixth of the latter. The snout is slightly convex, with the jaws nearly equal in front, and $1\frac{1}{2}$ as long as the eye. The upper maxillary reaches to the level of the posterior margin of the orbit. The præoperculum has the angle produced behind and very indistinctly denticulated; operculum with two points. Caudalis rhomboidal; the second anal spine rather feeble, its length being $4\frac{2}{3}$ in that of the head. Dorsal and caudal fins with blackish margins; axil blackish.

Rivers of Brazil.

a. Fine specimen. S. America. Presented by Sir R. Schomburgk.
b. Fine specimen. River Capin (Para). Purchased of Mr. Stevens.
c. Adult: skeleton. River Capin. Purchased of Mr. Stevens.
d. Half-grown. Capin. Purchased of Mr. Stevens.
e. Adult. From the Collection of the Zoological Society.

Skeleton.—Three portions may be distinguished in the *maxillary* bone: the basal portion, with a superior articular cavity for the processes of the intermaxillary, and a posterior for the articulation with the vomer; the middle portion, flat and narrow, widening where it passes into the extremity of the bone; this latter portion is extremely broad, three times broader than the middle one; at its inside it has a ridge along each of the margins. The entire bone has a very solid structure, and there are no vestiges of its having been separated into two bones. The *intermaxillary* is strong, but narrow; its posterior processes extend backwards to the level of the anterior margin of the eye, being only one-half the length of the bone; there is a flat triangular process posteriorly. The *mandibulary* has a high, sharp ridge at its outer side, running from the joint to the symphysis, and forming with the lower margin of the bone a deep channel: there are vestiges of four feeble ridges crossing the channel, and extending from the longitudinal ridge to the lower margin. These ridges are much more developed in other fishes with mucous cavities on the skull, and divide the mandibulary channel into as many cavities.

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[*] 1. Corvina? albiflora, *Rich. Ichth. Chin.* p. 226.—China.
2. Johnius resplendens, *Hombr. & Jacq. Poiss. Voy. Pole Sud*, p. 45. pl. 5. f. 1.—*Hab.* —— ?
3. Sciæna (?) rubella, *Natur. Libr. Fishes of Guiana*, ii. p. 133.—Rivers of Guiana.
4. Corvina grunniens, *Natur. Libr. Fishes of Guiana*, ii. p. 136. pl. 2.—Essequibo.
5. Sciæna crocea, *Richards. Ichth. Chin.* p. 224.—Chinese Seas.—The specimen, mentioned by Sir J. Richardson as in the British Museum, is not to be found in that collection.

[†] The scales of the lateral line being much larger than the others, this number gives that of the transverse rows above and below the lateral line.

The single parts of the *tympanic* bones may be well distinguished from one another: the hypotympanic is joined to the prætympanic by a narrow strip of cartilaginous tissue; all the other parts form together true sutures. The mesotympanic is the narrowest, and distinguished by a wide foramen. There is a cavity, closed by a membrane only, between the præ- and epitympanic; the former is exceedingly thin at its upper marginal part. The *pterygoid* is thin, narrow, extending nearly to the mandibulary joint; the *entopterygoid* is composed of a moderately strong ossified strip along its suture with the palatine and pterygoid bones, all the rest being exceedingly thin, like the corresponding part of the prætympanic. The *palatine* bone is more solid, quadrangular, with two of its sides free.

The anterior part of the *vomer* is thick, and furnished with two joints on each side, one for the palatine and the other for the maxillary: there is a projecting flat process in front, separating the maxillaries from each other. The palatal surface of the vomer is slightly concave, and broadest between the joints for the palatines. The posterior part of the vomer is finely tapering. The upper surface of the skull is entirely occupied by that *superstructure of bony ridges and crests,* by which the mucous cavities of the Sciænoids are supported and formed. The occipital crest is raised from above the foramen occipitale magnum, and separated into a posterior and superior portion by a narrow transversal ridge, which arises from the occiput on the same level with the upper surface of the skull; the posterior portion is nearly twice as wide as the superior. There is, on each side of the base of this portion, a horizontal, elongated, elliptical foramen in the supraoccipital, absent in many *Acanthopterygii*, and vertical in others. The superior portion extends a little on the frontal bones, and bifurcating emits two bars to form the middle and largest cavity. This cavity occupies the middle of the upper surface of the skull, and is elongate, quadrangular, with two pairs of sides, with a posterior and anterior acute angle, and with a pair of obtuse ones on the sides. The posterior pair of sides is much longer than the anterior; consequently the posterior angle is much more acute than the opposite. There are five other cavities besides, on each lateral half of the upper surface of the skull, three of which are complete by bony ridges. These are situated as follows:—

1. A pentagonal cavity between the central cavity and the upper margin of the orbit.

2. A pentagonal cavity on the temple, between the former and the posterior infraorbital bone.

3. A triangular cavity between the anterior part of the central cavity and the upper anterior angle of the orbit, with its smallest side in front, and an acute angle posteriorly.

4. There is, in front of the latter, another incomplete cavity, the bottom of which is formed by the turbinal bone.

5. The other incomplete cavity is situated on the side of the occipital crest, behind the cavity no. 1.

All these cavities are in open communication with one another, the bars extending from one point to the other like arches of a bridge.

The lower part of the skull is very much swollen, globular; this is not an enlargement of the capsule of the brain, but it contains the large otolithes which are observed in the fishes of this family.

The infraorbital arch is formed by six bones; they are all broad, very thin, with a stronger orbital ridge, from which radiate other transverse bars, dividing the infraorbital channel into as many cavities. This channel communicates anteriorly with the foremost cavity of the upper surface of the skull (4), posteriorly with the pentagonal cavity described (2). The first and second infraorbital bones form one straight continuous margin, rectangular to that of the third. The third has two transverse bars, the fourth, fifth and sixth severally one, and the ridge of the sixth forms one side of the pentagonal cavity (2). The limbs of the *præoperculum* are likewise transformed into a muciferous channel by the elevated interior ridge. This channel passes below into that of the mandibula, and above into the pentagonal cavity, and is itself divided into five grooves. The margin of the præoperculum is very thin, and there are visible about five very fine spines at its angle, which is rounded. The *operculum* is triangular, the upper side slightly convex, the lower concave; near its upper side and on the interior surface it has a bifurcating crest, each part of the fork terminating in a flat obtuse point; the lower point is the longer, and separated from the upper by a small notch. The *inter-* and *suboperculum* are elongate, elliptical.

The *glossohyal* is triangular, rather short, broadest anteriorly; the *epi-*, *cerato-* and *basi-hyal* bones are united to one bone, bearing the branchiostegals, which, seven in number, are all narrow, sword-shaped, the first thin, rib-like. The *urohyal* is a thin plate, strengthened by two longitudinal ridges on each side.

The bones of the humeral arch are thin and flexible; there are, on the *suprascapula*, some very delicate ridges, forming a quadrangular groove, by which the muciferous channels of the skull are continued into that of the lateral line. The other bones of the humeral arch are formed as usually, except the *clavicula*, which has a prominent process, bent forwards and upwards, near its base. The *pubic* bones have two ridges at the lower side and no posterior process.

It will be evident, from the description given, that the arrangement of the system of the muciferous channels is the same as in several *Percidæ* (*Acerina cernua*, *Percarina demidoffii*, &c.), or, in fact, as it is present, in a rudimentary state, in all the *Acanthopterygii*, and that it does not afford, of itself, a character by which the *Sciænidæ* may be distinguished from other fishes.

There are twelve abdominal and thirteen caudal *vertebræ*, the length of the former portion of the column being to that of the caudal as 12 : 17. The third and fourth vertebræ are furnished inferiorly with a pair of ridges, to which the air-bladder is fixed; each abdominal vertebra has a pair of ribs. The neural spines of the first six vertebræ are broad, compressed, and strong; the corresponding interneurals, or those of the spinous dorsal, are very broad, sometimes confluent, but exceedingly thin. The first interhæmal is long, slender, equal to the length of the first eight vertebræ, and attached to the thirteenth vertebra.

There is an outer series of larger *teeth* in the upper jaw, and within it a very narrow band of villiform teeth; in the lower jaw the stronger teeth are mixed with those of the narrow villiform band; and several on the sides are rather stronger than those in front of the upper jaw. The teeth of the upper pharyngeal bones are arranged in several roundish patches, and are card-like for the greater part. The inferior teeth form a narrow, long, villiform band.

2. Sciæna crouvina.

Johnius crouvina, *Castelnau, Anim. nouv. ou rares de l'Amér. du Sud, Poiss.* p. 11. pl. 5. f. 1.

D. $9 \mid \frac{1}{32}$. A. $\frac{2}{6}$ (in the figure; $\frac{1}{7}$ in the description).

The height of the body is four times in the total length, the length of the head $3\frac{1}{2}$. The snout is not obtuse, with the jaws equal (see figure quoted). The dorsal fins are united by a membrane, one-third as high as the soft dorsal; caudalis rounded; the second anal spine very short, equal to, or even shorter than, the width of the orbit (see fig.). Axil with a deep black blotch. (*Cast.*)

Rio Crixas, Araguay.

3. Sciæna aurata.

Johnius auratus, *Castelnau, Anim. nouv. ou rares de l'Amér. du Sud, Poiss.* p. 12. pl. 4. f. 2.

D. $9 \mid \frac{1}{36}$. A. $\frac{2}{6\,(7)}$.

The height of the body is equal to the length of the head, and $4\frac{1}{2}$ in the total. The snout is convex, with the upper jaw slightly overlapping the lower; operculum with one distinct point only. Caudalis pointed; the anal spine thick, its length being $2\frac{1}{3}$ in that of the head. Coloration uniform. (*Cast*)

Ucayala.

4. Sciæna obliqua.

Mugil obliquus, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 405.
Sciæna multifasciata, *Lesueur, Mem. Acad. Nat. Sc. Philad.* ii. p. 225.
Leiostomus humeralis, *Cuv. & Val.* v. p. 141. pl. 110.
—— obliquus, *Dekay, New York Fauna, Fishes*, p. 69. pl. 60. f. 195; *Holbr. Ichth. S. Carol.* p. 164 (pl. 24. f. 1, quoted in the text, cannot be referred to this species).

$$D.\ 10 \mid \frac{1}{30}.\quad A.\ \frac{2}{13}.$$

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{4}{5}$. The upper jaw convex, overlapping the lower; all the teeth small, villiform; præoperculum finely denticulated. Caudalis emarginate; the second anal spine feeble, one-third the length of the first ray. A black round blotch above the axil; back with more or less distinct oblique bands, directed forwards.

Fresh waters of the United States.

a–c. Adult: very bad state; have been in chloride of zinc. North America. From Mr. Warwick's Collection.

5. Sciæna xanthurus.

Leiostomus xanthurus, *Lacép.* iv. p. 439. pl. 10. f. 1; *Cuv. & Val.* v. p. 142; *Dekay, New York Fauna, Fishes*, p. 70.
Homoprion xanthurus, *Holbr. Ichth. S. Carol.* p. 170. pl. 24. f. 2 (the description does not agree either with the figure or with the species).

$$D.\ 11 \mid \frac{1}{32\text{–}34}.\quad A.\ \frac{2}{13}.$$

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{4}{5}$. The upper jaw convex, overlapping the lower; all the teeth small, villiform; præoperculum finely denticulated. Caudalis emarginate; the second anal spine feeble, one-third the length of the first ray. Coloration uniform.

United States; West Indies.

a. Adult: skin. New York. From Dr. Parnell's Collection.

6. Sciæna lineata.

Leiostomus lineatus, *Ayres, Proc. Cal. Acad. Nat. Sc.* i. 1855, p. 25; *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 135, and *U. S. Pacif. R. R. Exped. Fishes*, p. 99 (pl. 22 B. f. 1–4?*).

$$D.\ 13 \mid 22.\quad A.\ \frac{2}{12}.$$

The length of the head constitutes a little less than one-fourth of the total. The snout is rounded and projects beyond the lower jaw, the cleft of the mouth being nearly horizontal. Præoperculum finely denticulated. Caudal subcrescentic posteriorly; the second anal spine small. Greyish-brown, with oblique waving lines of umber-brown. (*Gir.*)

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* It is much to be regretted that the arrangement of the plates, with which Girard has illustrated his species, has not been executed without confusion. In the present case, pl. 22 C. is quoted on p. 99, pl. 22 B. on p. 386, whilst no representation at all of this fish is to be found in volume x., which contains the description.

San Francisco.

7. Sciæna adusta.

Sciæna (Corvina) adusta, *Agass. Spix, Pisc. Bras.* p. 126. tab. 70; *Jenyns, Zool. Beagle, Fishes*, p. 42.

D. $10 \left| \frac{1}{28} \right.$. A. $\frac{2}{7}$. L. lat. 55.

The length of the head is one-fourth of the total, the height of the body rather less. The snout convex, with the upper jaw overlapping the lower; the upper lip with a small lobule on each side; no larger teeth in the outer series. Præoperculum with stronger denticulations at the angle. Caudalis convex; the second anal spine rather thick, one-half the length of the first ray. Dark brownish-grey, with oblique streaks on the back; all the fins blackish.

Maldonado Bay. Monte Video.

a. Half-grown. S. America. Presented by Lord Stuart.
b. Half-grown. S. America. Presented by Lord Stuart.

If these specimens, which are rather discoloured, really belong to the above species, they ought to be transferred to Cuvier's genus *Leiostomus*, having the teeth of the outer series scarcely differing in size from the remainder.

8. Sciæna ocellata.

Perca ocellata, *L. Syst. Nat.* p. 483; *Shaw, Zool.* iv. p. 550.
Centropomus ocellatus, *Lacép.* iv. pp. 257, 279.
Lutjanus triangulum, *Lacép.* iv. pp. 181, 217, iii. pl. 24. f. 3.
Sciæna imberbis, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 411.
Corvina ocellata, *Cuv. & Val.* v. p. 134. pl. 108; *Dekay, New York Fauna, Fishes*, p. 75. pl. 21. f. 61; *Holbr. Ichthyol. S. Carol.* p. 149. pl. 21. f. 2.

D. $10\text{–}11 \left| \frac{1}{25\text{–}26} \right.$. A. $\frac{2}{7\text{–}8}$. Cæc. pylor. 7–8. Vert. 11/14.

The height of the body is $4\frac{3}{4}$ in the total length, the length of the head four times. The upper jaw overlapping the lower; in each of the jaws an external series of larger teeth, those of the mandibulary stronger. Præoperculum and suprascapula distinctly crenulated. Caudalis truncated; the second anal spine two-thirds of the length of the first ray. One or two round black spots at the root of the caudal fin.

Fresh waters of the United States.

a, b. Adult: skins. America. From Dr. Parnell's Collection.

9. Sciæna lanceolata.

Homoprion lanceolatus, *Holbr. Ichth. S. Carol.* p. 168. pl. 23. f. 1.

D. $11 \left| \frac{1}{21} \right.$. A. $\frac{2}{7}$.

Præoperculum with large radiating spines at the angle. The snout is convex, with the upper jaw overlapping the lower, and equals the width of the eye, the diameter of which is 4¼ in the length of the head. Upper jaw with an external series of larger, pointed teeth. Caudalis pointed; the second anal spine stout. Coloration uniform, very light; a row of dark spots near the root of each spine and ray of the dorsal fins. (*Holbr.*)

Port Royal Sound (S. Carolina).

10. Sciæna senegalensis.

Corvina senegalla, *Cuv. & Val.* v..p. 132.

D. $10 \mid \frac{1}{22}$. A. $\frac{2}{7}$. Cæc. pylor. 4.

The upper jaw overlapping the lower; in both the jaws an external series of larger teeth. Præoperculum scarcely crenulated. Caudalis rhomboidal. Body uniform; dorsal fins with three series of black spots. (*Cuv.*)

Senegal.

11. Sciæna diacanthus.

Lutjanus diacanthus, *Lacép.* iv. pp. 195, 244.
Russell, ii. pl. 115, 116.
Bola chaptis, *Buch. Ham.* p. 77. pl. 10. f. 25.
Johnius cataleus, *Cuv. Règne Anim.*; *Cuv. & Val.* v. p. 128.
—— chaptis, *Cuv. & Val.* v. p. 130.
Corvina catalea, *Belanger, Voy. Ind. Orient. Zool.* p. 360; *Richards. Ichth. Chin.* p. 226; *Bleek. Verhand. Bat. Gen.* xxiii. *Sciæn.* p. 18.
Johnius platycephalus, (*Kuhl & Van Hasselt*) *Cuv. & Val.* v. p. 132.
Sciæna maculata, *Gray, Ind. Zool.* ii. pl. 89. f. 1 (young).
Johnius diacanthus, *Cant. Catal.* p. 67; *Bleek. Java*, iv. p. 326.
—— valenciennii, *Eydoux & Souleyet, Voy. Bonite, Zool.* i. p. 159. pl. 1. f. 2.

D. $10 \mid \frac{1}{22-23}$. A. $\frac{2}{7}$. L. lat. 55.

The height of the body is equal to the length of the head, and about 4 to 4½ in the total. The snout is moderately convex, with the upper jaw overlapping the lower, longer than the eye, the diameter of which is 4½ to 6½ in the length of the head. The upper maxillary reaches a little behind the posterior margin of the orbit. An outer series of larger teeth in the upper jaw. Præoperculum rounded, distinctly denticulated. The pectoral fins are longer than the ventrals; caudalis pointed; the second anal spine about one-third of the length of the head. Coloration of body uniform, in young individuals spotted with brown; the dorsal and caudal fins with round brown spots; the pectoral, ventral, and anal fins black in young individuals

All the Indian Seas.

a. Half-grown. From the Collection of the Zoological Society.
b. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
c. Half-grown: stuffed. China. Presented by J. R. Reeves, Esq.
d. Half-grown: stuffed. Bay of Bengal. From Dr. Cantor's Collection.

e. Adult: skin. Malayan Peninsula. From Dr. Cantor's Collection.
f, g. Half-grown and young: skins. Malayan Peninsula. From Dr. Cantor's Collection.
h. Adult: stuffed. Calcutta. From the Collection of the East India Company.

12. Sciæna maculata.

Russell, pl. 123.
Johnius maculatus, *Bl. Schn.* p. 75 (not *Cant.*)
Corvina maculata, *Cuv. & Val.* v. p. 126.

$$\text{D. } 10 \left| \tfrac{1}{23}. \right. \quad \text{A. } \tfrac{2}{8}.$$

The upper jaw overlapping the lower, with an external series of larger teeth. Præoperculum distinctly denticulated. Caudalis rhomboidal. Back with five brown or black cross-bars, sometimes interrupted and forming dark irregular blotches

Tranquebar; Pondicherry; Malabar.

The fish described by Cantor (*Catal.* p. 68) as *J. maculatus*? var., appears to be an entirely different species, near *Corvina albida*. The British Museum possesses a skin of a young specimen from Dr. Cantor's Collection, but I am unable to decide the question from this specimen alone.

13. Sciæna macrophthalmus.

Otolithus macrophthalmus, *Bleeker, Java*, i. p. 99, and *Verhand. Batav. Genootsch.* xxiii. *Sciæn.* p. 16.

$$\text{D. } 10 \left| \tfrac{1}{23\text{–}24}. \right. \quad \text{A. } \tfrac{2}{7}. \quad \text{L. lat. } 50\text{–}55.$$

The height of the body is $3\frac{3}{4}$ in the total length, and equals the length of the head; the snout is obtuse, and equals the diameter of the eye, which is one-fourth of the length of the head. Two small canine teeth in the upper jaw, none in the lower. Præoperculum denticulated in young individuals. Caudalis truncated; coloration uniform. (*Bl.*)

Seas of Batavia, Bantam, Samarang, and Pasuruan.

14. Sciæna aquila.

Σκίαινα, *Aristot. Hist. Anim.* viii. cap. 19.
Umbra, *Salvian.* fol. 115 *a*; *Bellon.* pp. 117 & 119.
? Latus, Peis-rei, *Rondel.* p. 135.
Maigre, Poisson royal, *Duham. Pêches*, ii. sect. 6. p. 137. pl. 1. f. 3.
Cheilodipterus aquila, *Lacép.* v. p. 685.
Labrus hololepidotus, *Lacép.* iii. p. 517. pl. 21. f. 2.
Sciæna umbra, *Cuv. Mém. Mus.* i. p. 1, and *Règne Anim.*; *Bonap. Faun. Ital. Pesci*, pl. . f. 1.
Perca vanloo, *Risso, Ichth. Nice*, edit. 1. p. 298. pl. 9. f. 30.
Sciæna aquila, *Risso, l. c.* edit. 2. iii. p. 411; *Cuv. & Val.* v. p. 28. pl. 100; *Neill in Edinb. New Phil. Journ.* 1826, p. 135; *Flem. Brit. Anim.* p. 213; *Parn. Fishes Frith of Forth*, p. 40; *Yarrell, Brit. Fishes*, p. 104; *Cuv. Règne Anim. Ill. Poiss.* pl. 27. f. 1 (not *Rosenthal*).

Sciæna hololepidota, *Cuv. & Val.* v. p. 53; *Quoy & Gaim. Voy. Astrol. Poiss.* p. 697. pl. 12. f. 1.
—— capensis, *Smith, Ill. S. Afr. Fishes*, pl. 15.

D. 10 | $\frac{1}{26-27}$. A. $\frac{2}{7}$. L. lat. 53. L. transv. $\frac{11}{20}$. Cæc. pylor. 10. Vert. 11/13.

The length of the head forms one-fourth of the total, the greatest depth of the body one-fifth; the diameter of the eye is one-sixth of the length of the head, and one-half of that of the snout. The denticulations of the præoperculum become obsolete with age; operculum and suboperculum not notched at their lower margins. Caudal fin nearly truncated.

Mediterranean; British Channel; Frith of Forth; Cape Seas.

a. 5 feet 1 inch long: stuffed. English coast.
b. 4 feet 4 inches long and 11 inches high. English coast.—Snout deformed.
c. Large specimen: stuffed.
d. Large specimen: stuffed. Brixham. From Dr. Parnell's Collection.
e. Adult: stuffed. From Mr. Yarrell's Collection.
f. Adult: stuffed. Plymouth. Presented by Lieutenant H. F. Spence, R.N.
g, h. Fine specimens. Lisbon. Presented by the Rev. R. T. Lowe.
i. Adult. Algoa Bay.—(*Sciæna hololepidota.*)

15. Sciæna sina.

Johnius sina, *Cuv. & Val.* v. p. 122.
Corvina sina, *Belang. Voy. Indes Orient. Zool.* p. 359; *Faun. Japon. Poiss.* p. 58. pl. 24. f. 2 (not good); *Bleek. Verhand. Batav. Genootsch.* xxvi. p. 82.

D. 10 | $\frac{1}{27-28}$. A. $\frac{2}{7}$. L. lat. 46.

The height of the body is 4 or $4\frac{1}{4}$ in the total length, and equals that of the head; the diameter of the eye is 3 or $3\frac{1}{2}$ in the latter; the snout is obtuse, convex, shorter than the diameter of the eye, with the upper jaw rather longer than the lower. The upper maxillary reaches to below the posterior half of the orbit; the upper jaw is armed with an external series of larger teeth. Præoperculum rounded, with very distinct spinous teeth. The pectoral fins longer than the ventrals; caudalis pointed; the second anal spine one-third or one-fourth of the length of the head. Above greyish-green, with a dark blotch behind the operculum.

Pondicherry; coast of Malabar; Japanese Sea.

16. Sciæna dussumieri.

Corvina dussumieri, *Cuv. & Val.* v. p. 119; *Règne Anim. Ill. Poiss.* pl. 28. f. 2.
Johnius dussumieri, *Cant. Catal.* p. 64.

D. 10 | $\frac{1}{28-29}$. A. $\frac{2}{7}$. Vert. 10/14.

The height of the body is $5\frac{1}{4}$ in the total length, the length of the head $4\frac{1}{2}$. The snout is convex, with the upper jaw overlapping the lower, and equal to the diameter of the eye, which is one-fourth of the length of the head. Præoperculum slightly denticulated. Caudalis convex; the second anal spine one-half the length of the first ray. Coloration uniform; the vertical fins with blackish margins.

Coast of Malabar; Sea of Pinang; Malayan Peninsula; Singapore; Chinese Sea.

a. Young: not good state. China.
b. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.

17. **Sciæna trachycephalus.**

Corvina trachycephalus, *Bleeker, Borneo,* ii. p. 269, and *Borneo,* iv. p. 200.

$$D.\ 8 \Big| \frac{1}{24\text{–}27}. \quad A.\ \frac{2}{7}. \quad L.\ lat.\ 60.$$

The height of the body is $5\frac{1}{4}$–6 times in the total length, the length of the head $4\frac{1}{2}$–$4\frac{3}{4}$. The snout is obtuse, convex, with the upper jaw overlapping the lower, rather longer than the diameter of the eye, which is $4\frac{1}{3}$–5 times in the length of the head; the cleft of the mouth horizontal; the upper maxillary reaching to below the middle of the orbit. Præoperculum rounded, with spinous teeth. The first ventral ray produced into a short filament; the second anal spine one-third of the length of the head; caudalis pointed. Above greyish; the first dorsal minutely dotted with blackish. (*Bl.*)

Rivers of Bandjermassing (Borneo).

18. **Sciæna hypostoma.**

Corvina hypostoma, *Bleeker, Sumatra,* iii. p. 5.

$$D.\ 9\text{–}10 \Big| \frac{1}{31\text{–}32}. \quad A.\ \frac{2}{7}. \quad L.\ lat.\ 45.$$

The height of the body is $4\frac{1}{2}$ to $4\frac{2}{5}$ in the total length, the length of the head five times; the diameter of the eye is 4–$4\frac{1}{2}$ in the latter. The snout is obtuse, as long as the diameter of the eye, with the upper jaw overlapping the lower. The upper maxillary reaches to below the middle of the orbit; the upper jaw with an outer series of larger teeth. Præoperculum rounded, distinctly denticulated. The pectoral fins somewhat longer than the ventrals; caudalis subrhomboidal; the second anal spine one-third of the height of the body. Coloration uniform. (*Bl.*)

Sea of Padang (Sumatra).

19. **Sciæna goldmanni.**

Corvina goldmanni, *Bleeker, Batjan,* i. p. 371.

$$D.\ 9 \mid 31. \quad A.\ \frac{2}{7}. \quad L.\ lat.\ 47.$$

The height of the body is $4\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{3}$; the diameter of the eye is $4\frac{2}{3}$ in the latter. The snout is obtuse, shorter than the eye, with the upper jaw slightly overlapping the lower. The upper maxillary reaches to below the posterior half of the orbits; the upper jaw armed with an outer series of larger teeth. Præoperculum rounded, denticulated, with several larger spinous teeth at the angle. Caudalis pointed; pectoral and ventral fins nearly equal in length; the second anal spine $2\frac{1}{2}$ in the length of the head. Above greenish, with a darker blotch above the opercle; the spinous dorsal edged with brown. (*Bl.*)

Batjan.

20. Sciæna microdon.

Otolithus microdon, *Bleeker, Java,* i. p. 99, and *Verhand. Batav. Genootsch.* xxii. *Madura,* p. 10, xxiii. *Sciæn.* p. 16.

D. $9 \mid \frac{1}{34-36}$. A. $\frac{2}{7}$. L. lat. 90.

The height of the body is one-fifth of the total length,.the length of the head one-fourth. The snout is longer than the diameter of the eye, which is one-sixth of the length of the head; jaws equal in length; small canines in the upper jaw, none in the lower; præoperculum with distinct denticulations. Caudalis pointed; the second anal spine half as long as the first ray. Coloration uniform. (*Bl.*)

Seas of Batavia, Samarang, and Surabaja.

21. Scæina vogleri.

Otolithus vogleri, *Bleeker, Tydschr. Nederl. Indie,* iv. p. 253.

D. $10 \mid \frac{1}{27-28}$. A. $\frac{2}{7-8}$. L. lat. 40.

The height of the body equals the length of the head, and is one-fourth of the total; the diameter of the eye is $4\frac{2}{3}$ in the length of the head. Snout obtuse, with the upper jaw projecting and convex, longer than the diameter of the eye. The upper maxillary reaches to below the middle of the orbit; intermaxillary with an outer series of larger teeth, without distinct canines; canines in the lower jaw none. Præoperculum distinctly denticulated. Caudalis pointed; the second anal spine half as long as the first ray. Coloration uniform. (*Bl.*)

Sea of Sumatra.

22. Sciæna borneensis.

Otolithus borneensis, *Bleeker, Borneo,* ii. p. 268.

D. $10 \mid \frac{1}{28}$. A. $\frac{2}{7}$. L. lat. 40.

The length of the head is nearly equal to the height of the body, and one-fourth of the total length. The snout is obtuse, convex, with the jaws equal, as long as the diameter of the eye, and $3\frac{1}{2}$ in the length of the head. Upper jaw with four canine teeth of moderate size, the lower jaw without canines. Præoperculum denticulated at the inferior limb as well as at the posterior. (*Bl.*)

Rivers of Bandjermassing (Borneo).

23. Sciæna brevidorsalis.

$D.\ 10 \mid \frac{3}{17}.\quad A.\ \frac{2}{11}.$ L. lat. 47.

The height of the body is nearly equal to the length of the head, and one-fourth of the total. The snout is short, obtuse, shorter than the width of the eye, with the upper jaw overlapping the lower, and with the cleft of the mouth very oblique. The upper maxillary reaches a little behind the vertical from the centre of the orbit. The diameter of the eye is $3\frac{1}{2}$ in the length of the head, and much shorter than the interspace between the eyes. The præoperculum is rounded and denticulated throughout: the suprascapula is very large, and would entirely cover the eye; its margin is furnished with flexible setiform teeth. Caudalis elongate, pointed; the second anal spine $2\frac{2}{3}$ in the length of the head. The outer row of intermaxillary teeth contains scarcely any larger ones. Pseudobranchiæ.

a. Not good state. East Indies? From the Haslar Collection.

This species may be readily distinguished by the small number of the dorsal rays. At present, I know of no better place for it, although its physiognomy is not that of a *Sciæna*.

	inches.	lines.
Total length	5	6
Height of the body	1	5
Length of the head	1	4
Diameter of the eye	0	$4\frac{1}{2}$
Interspace between the eyes	0	$5\frac{1}{2}$
Length of the third dorsal spine	0	10
——— of the second dorsal ray	0	9
——— of the second anal spine	0	6
——— of the first anal ray	0	8

24. Scæina deliciosa.

Corvina deliciosa, *Tschudi, Faun. Per. Ichthyol.* p. 8.

$D.\ 10 \mid \frac{1}{20}.\quad A.\ \frac{2}{10}.$

The height of the body is to the total length as 1 : 4·7; the cleft of the mouth extends to below the middle of the eye. The angle of the præoperculum rounded, denticulated; the superior margin of the operculum serrated. The lateral line is continued on the caudal fin; the third dorsal spine is the longest; caudal truncated; the length of the second anal spine is less than one-half of that of the first ray; fins scaly. Coloration uniform. (*Tsch.*)

Coast of Peru.

25. Sciæna minor.

Corvina minor, *Tschudi, l. c.* p. 9.

$D.\ 13 \mid 20.\quad A.\ \frac{2}{11}.$

The height of the body is $3\frac{1}{3}$ in the total length; the cleft of the mouth extends to below the middle of the eye. The angle of the præoperculum with a somewhat strong spine, pointing downwards; neck with an acute edge. The third dorsal spine is the longest, and higher than the soft fin; the second of the anal fin is rather stout, and half the length of the first ray; caudal truncated; the pectoral reaches to the vertical from the fourth dorsal ray. Silvery, with some blackish dots during life. (*Tsch.*)

Coast of Peru.

8. CORVINA[*].

Corvina, *Cuv. Règne Anim.*; *Cuv. & Val.* v. p. 81.

Body oblong; muzzle convex, with the upper jaw overlapping the lower, and with the cleft of the mouth more or less horizontal. The outer series of the jaws generally contains larger teeth; never large canines. No barbel. The second spine of the anal strong or very strong; dorsal fin transparent. Pseudobranchiæ. The air-bladder with appendages. Pyloric appendages in small number.

Mediterranean; tropical parts of the Atlantic; fresh waters of the United States. East Indian Seas, several species entering the rivers.

1. Corvina nigra.

Tinca marina, *Bellon.* i. p. 111. fig. in p. 113; *Gesner, Paralip.* p. 14.
Coracinus subniger, *Rondel.* v. p. 126. fig. 2.
Corvo di fortiera, *Salvian.* fol. 117 *a*; *Willughby,* p. 300. tab. S. 20.
Coracinus niger, *Salvian.* fol. 118 *b*.
Sciæna, sp. 2, *Artedi, Synon.* p. 65, and *Genera,* p. 39.
—— umbra, *L. Syst. Nat.* p. 480; *L. Gm.* p. 1298; *Risso, Ichth. Nice,* p. 295.
—— nigra, *Bl.* vi. p. 35. taf. 297.
Johnius niger, *Bl. Schn.* p. 76.
Sciæna umbra, *Rosenth. Ichthyol. Taf.* tab. 17. f. 1
Coracinus chalcis, *Pall. Zoogr.* iii. p. 256.

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[*] 1. Corvina celebica, *Bleeker, Celebes,* v. p. 244.—Macassar.
2. —— dorsalis, *Peters, Wiegm. Arch.* 1855, p. 242.—Mozambique.
3. —— clavigera, *Cuv. & Val.* v. p. 101.—Senegal. (The swelling of the spine of the second dorsal may be accidental in the individual.)
4. Corvina biloba, *Cuv. & Val.* v. p. 112.—*Hab.?*
5. Sparus argenteus, *Houttuyn. Act. Haarl.* xx. 2. p. 320; *Lacép.* iv. pp. 28, 85, 91.—Corvina argentata, *Cuv. & Val.* v. p. 114.
6. Corvina grypota, *Richards. Ichth. Chin.* p. 225.—Canton.
7. Amblodon neglectus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1858, p. 167.—Texas.

Corvina oxyptera, *Dekay, New York Fauna, Fishes,* p. 77. pl. 30. f. 96, probably belongs to *Anthias,* as I have stated above. With the slightest knowledge of fishes the author would have been enabled to perceive, that a fish with vomerine teeth, and with a single scaly dorsal fin, cannot be referred to *Corvina.* The figure is bad, and does not agree with the description, showing twelve spines, whilst ten are stated in the description, &c. &c.

Corvina nigra, *Cuv. & Val.* v. p. 86; *Bonap. Faun. Ital.* p. . pl. . f. 2; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 382. pl. 3. f. 1; *Cuv. Règne Anim. Ill. Poiss.* pl. 28. f. 1.
—— canariensis, *Cuv. & Val.* v. p. 93 (young).

D. $10 \mid \frac{1}{25}$. A. $\frac{2}{6-8}$. L. lat. 60. L. transv. 30. Cæc. pylor. 8. Vert. 11/14.

The height of the body is nearly equal to the length of the head, and $3\frac{1}{2}$ in the total; the diameter of the eye equals the length of the snout, and is one-fourth of the length of the head, the upper jaw overlapping the lower. The band of the maxillary teeth with an outer row of stronger ones. Præoperculum scarcely denticulated; suprascapula and coracoid entire. The ventral fins longer than the pectorals. The second anal spine very strong, but one-third shorter than the first ray. Caudalis truncated. Blackish-brown; ventral and anal fins deep black.

Mediterranean; Canary Islands.

a. Young. Dalmatia. } Anal $\frac{2}{6}$. *Corvina canariensis.*
b. Young: bad state. }

2. Corvina nigrita.

Cuv. & Val. v. p. 103.

D. $10 \mid \frac{1}{33}$. A. $\frac{2}{6}$. Cæc. pylor. 8.

The height of the body equals the length of the head, and is $3\frac{2}{3}$ in the total. The upper jaw overlapping the lower. The band of the maxillary teeth with an outer row of somewhat stronger ones. Præoperculum finely denticulated. The second anal spine very strong. Caudalis rhomboidal. Above brownish; the first dorsal brown, black-edged, with one longitudinal series of blackish spots, and the second with two.

Senegal.

3. Corvina oscula.

Sciæna oscula, *Lesueur, Journ. Acad. Nat. Sc. Philad.* 1822, ii. p. 252. pl. 13.
—— grisea, *Lesueur, l. c.* p. 254.
Corvina oscula, *Cuv. & Val.* v. p. 98; *Kirtland, Bost. Journ.* iii. p. 350. pl. 6. f. 3, and *Ohio Report*, p. 193; *Dekay, New York Faun. Fishes*, p. 73. pl. 21. f. 63.
Amblodon grunniens, (*Raf.*) *Girard, U. S. Pacif. R. R. Exped. Fishes*, p. 96. pl. 23.

D. $10 \mid \frac{1}{29-32}$. A. $\frac{2}{7}$. L. lat. 50–55. L. transv. $\frac{10}{14}$. Cæc. pylor. 7.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head four times. The snout is obtuse, convex, with the upper jaw overlapping the lower, and equals the interspace between the eyes. The diameter of the eye is much smaller, and $5\frac{1}{3}$ in the length of the head. The upper maxillary with an outer series of larger teeth.

Præoperculum rounded, with distinct spinous teeth posteriorly and inferiorly; suprascapula and coracoid entire. The dorsal spines strong, the first half as thick as the second of the anal. Caudalis irregularly truncated; the second anal spine strong, one-third shorter than the first ray. Pectoral pointed, longer than the ventral. Coloration uniform.

Fresh waters of the United States.

a. Adult: skin. Ohio Canal, near Portsmouth, United States. From Dr. Parnell's Collection.

b. Adult: skin. Pontchartrain Lake. From Dr. Parnell's Collection.

4. **Corvina richardsonii**

Cuv. & Val. v. p. 100; *Richards. Faun. Bor. Amer. Fishes*, p. 64. pl. 77; *Dekay, New York Fauna, Fishes*, p. 76. pl. 20. f. 55 (bad copy).

D. $9 \mid \frac{1}{29}$[*]. A. $\frac{1}{7}$. L. lat. 53–54. L. transv. $\frac{8}{19}$.

The curve from the snout to the dorsal fin is quadrantal and abrupt, the head and shoulders being very prominent. The height of the body is $2\frac{3}{4}$ in the total length, the length of the head $3\frac{1}{2}$. The jaws are equal in front, and the snout is twice as long as the diameter of the eye. The upper maxillary with an outer row of larger teeth. The whole free edge of the præoperculum, that of the interoperculum and of the suboperculum anteriorly, finely denticulated. The pectorals pointed, and considerably longer than the ventrals. There is no first short anal spine (?); the only one present is strong, and one-third shorter than the first ray. Caudalis truncated. Greenish-grey, with darker bands across the back. (*Rich.*)

Lake Huron.

5. **Corvina saturnus.**

Amblodon saturnus, *Girard in U. S. Pacif. R. R. Exped. Fishes*, p. 98.

D. $10 \mid \frac{1}{28}$. A. $\frac{2}{7}$.

The height of the body is one-third of the total length, the length of the head one-fourth. Snout thick and rounded. The pectorals do not reach so far backwards as the ventrals, which do not extend to the vent; caudal fin truncated; the second anal spine very stout, and nearly as long as the second soft ray. Purplish-brown, each scale with a darker centre; an opercular patch; fins rather dark. (*Gir.*)

San Diego (California).

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[*] Cuvier as well as Richardson state 18 soft rays for the soft dorsal fin, a number quite unusual in these fishes. In fact, in the only specimen known, the fin is prolonged into a low membrane, in which Richardson found imbedded "eleven obtuse cartilages or rudimentary rays; they have twelve interspinous bones." I think this to be a sufficient proof of the abnormal condition of the fin in that specimen.

6. Corvina argyroleuca.

Bodianus argyroleucus, *Mitchill, Trans. Lit. & Phil. Soc. New York,* p. 417. pl. 6. f. 3.

Corvina argyroleuca, *Cuv. & Val.* v. p. 105; *Dekay, New York Fauna, Fishes,* p. 74. pl. 18. f. 51 (very bad).

D. $11\,|\,\frac{1}{22}$. A. $\frac{2}{9}$. Cæc. pylor. 8. Vert. 11/14.

The height of the body equals the length of the head, and is one-fourth of the total. Jaws nearly equal in front; an exterior series of larger teeth in the maxillary bone. Præoperculum with stronger teeth at the angle, the lowest of which is directed downwards. The dorsal spines moderately strong; caudalis irregularly truncated; the second anal spine strong, shorter than the first ray. Coloration uniform.

United States. Martinique.

7. Corvina stellifera.

Bodianus stellifer, *Bloch,* taf. 231. f. 1.

Corvina trispinosa, *Cuv. & Val.* v. p. 109.

? Corvina trispinosa, *Gay, Hist. Chile, Zool.* ii. p. 184.

D. $10\,|\,\frac{1}{23}$. A. $\frac{2}{9}$. L. lat. 47. L. transv. $\frac{5}{12}$. Cæc. pylor. 4.

The height of the body equals the length of the head, and is one-fourth of the total; head very broad, the interspace between the eyes being one-third of the length of the head, and twice as broad as the length of the diameter of the eye. Snout obtuse, with the upper jaw overlapping the lower; the upper maxillary reaches behind the level of the orbit, and is provided with an exterior series of larger teeth. Præoperculum rounded, with spinous teeth. Caudalis pointed. The second anal spine one-fourth shorter than the first ray, and rather longer than one-half of the length of the head. The first dorsal brown. No pseudobranchiæ.

Atlantic coasts of Tropical America.

a–d. Adult. West Indies.
e–g. Adult and young: bad state. West Indies.
h–k. Half-grown: not good state. From the Haslar Collection.

8. Corvina ronchus.

Cuv. & Val. v. p. 107.

D. $10\,|\,\frac{1\text{–}2}{22\text{–}24}$. A. $\frac{2}{8\text{–}9}$. L. lat. 52–55. L. transv. $\frac{9}{13}$. Cæc. pylor. 6. Vert. 11/13.

The height of the body equals the length of the head, and is one-fourth of the total. The interspace between the eyes is broader than the diameter of the eye is long; the latter is one-fifth of the length of the head, and $1\frac{1}{2}$ in that of the snout. The upper jaw slightly overlapping the lower; an exterior series of larger teeth in the maxillary bone. Præoperculum rounded, with spinous teeth along its posterior edge, strongest at the angle, the lowest directed downwards; suprascapula serrated, coracoid entire. The dorsal spines moderately strong; caudalis irregularly truncated; the second anal spine very strong, as long as the first ray, two-thirds the length of the head. Pectoral and ventral fins equal in length. Silvery: the first dorsal brownish, the other vertical fins with the margins minutely dotted with black. Pseudobranchiæ.

Caribbean Sea; Surinam.

a. Fine specimen. From the Collection of the Zoological Society.
b. Fine specimen. S. Domingo. Purchased of Mr. Cuming.
c. Half-grown. S. Domingo. Purchased of Mr. Cuming.
d, e. Half-grown: skins. Jamaica. From Dr. Parnell's Collection.
f. Half-grown. Bahia. Purchased of M. Parzudaki.
g. Half-grown. Sandwich Islands (?). From the Collection of the Zoological Society.
h. Half-grown: skin.

9. **Corvina cuja.**

Bola cuja, *Buch. Ham. Gang. Fishes,* pl. 12. f. 27.
? Johnius serratus, *Bl. Schn.* p. 76.
Corvina cuja, *Cuv. & Val.* v. p. 96; *Faun. Japon. Poiss.* p. 58.

D. $10 \mid \frac{1}{27\,(29)}$. A. $\frac{2}{7}$. L. lat. 48. L. transv. $\frac{8}{13}$.

The height of the body is nearly equal to the length of the head, and $3\frac{1}{4}$ in the total length. The snout is convex, rather obtuse, with the jaws nearly equal; it is longer than the diameter of the eye, which is one-sixth of the length of the head; the interspace between the eyes is rather narrower than the horizontal diameter of the eye is long. An outer series of rather larger teeth in the maxillary bone. The second anal spine exceedingly strong, as long as the first ray, and $\frac{3}{4}$ of the length of the head; the caudal fin covered with scales, the second dorsal and the anal scaly for one-third of their height. Caudalis rounded. Oblique streaks above the lateral line, horizontal ones beneath; both dorsal fins with two longitudinal series of brown spots.

Ganges. Japan.

a, b. Large specimens: stuffed.
c, d. Adult: stuffed.
e. Young. Calcutta. From the Collection of Messrs. von Schlagintweit.
f. Dried.

10. **Corvina miles.**

Holocentrus soldado, *Lacép.* iv. pp. 344, 373.
Russell, pl. 117.
Corvina miles, *Cuv. & Val.* v. p. 94, ix. p. 479: *Bleek. Verhand. Batav. Genootsch.* xxiii. *Sciæn.* p. 17.
—— soldado, *Cant. Catal.* p. 70.

D. $9\text{–}10 \mid \frac{1}{29\text{–}30}$. A. $\frac{2}{7}$.

The height of the body is nearly equal to the length of the head,

and one-fourth of the total; the diameter of the eye equals the length of the snout, and is one-fourth of the length of the head. The upper jaw overlapping the lower. The band of maxillary teeth with an outer row of stronger ones. The second anal spine very strong, and as long as the first ray; caudalis pointed. Above greyish-green, sides and belly silvery; the dorsals minutely dotted with brown, and with a black upper margin; in front of each dorsal ray a small brownish spot; ventrals whitish; the other fins with a blackish margin.

Seas of Bombay, Ceylon, Tenasserim, Coromandel, Pinang, and Java.

a. Half-grown. Ceylon. From Mr. Cuming's Collection.
b, *c*. Adult and half-grown: skins. Malayan Peninsula. From Dr. Cantor's Collection.

Corvina wolffii (Bleeker, Borneo, iii. p. 66) appears to be closely allied to this species.

11. Corvina coitor.

Bola coitor, *Buch. Ham.* pp. 75 & 368. pl. 27. f. 24.
Corvina coitor, *Cuv. & Val.* v. p. 116.
—— nalla-katchelee, *Richards. Ichth. Chin.* p. 226.

D. $10 \mid \frac{1}{27}$. A. $\frac{2}{7}$. Cæc. pylor. 6.

The height of the body equals the length of the head, and is one-fourth of the total. Snout convex, rather prominent, with the upper jaw overlapping the lower, one-half longer than the diameter of the eye, which is $5\frac{1}{2}$ in the length of the head. Præoperculum slightly denticulated. The band of the maxillary teeth with an outer series of larger ones. The caudal fin pointed; the second anal spine four-fifths the length of the first ray. Above brownish-green, the dorsal fins with some indistinct brownish spots.

Ganges; Irawadi.

a. Adult and half-grown. China.
b. Adult. China. Presented by J. R. Reeves, Esq.
c. Half-grown. China.
d, *e*. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
f, *g*. Half-grown: stuffed. Calcutta. From the Collection of the East India Company.
h. Half-grown. Presented by Sir J. Richardson.
i. Half-grown. India. Presented by G. R. Waterhouse, Esq.

12. Corvina polycladiscus.

Bleeker, *Borneo*, vi. p. 420.

D. $10 \mid \frac{1}{27}$. A. $\frac{2}{7}$. L. lat. 50.

The height of the body equals the length of the head, and is one-fourth of the total. The snout is convex, with the upper jaw overlapping the lower, and a little longer than the eye, the diameter of which is one-fifth the length of the head. The upper maxillary reaches to below the middle of the orbit; larger teeth in the outer series of the intermaxillary. Præoperculum with the hinder limb very oblique and slightly denticulated. Scales of the lateral line with numerous branched tubules. The first ray of the ventral produced into a filament; the length of the second anal spine $1\frac{3}{4}$ in that of the head; caudalis pointed. Back with numerous blackish oblique streaks; fins yellowish, the dorsal minutely dotted with brown. (*Bl.*)

Rivers of Bandjermassing (Borneo).

13. Corvina furcræa.

Perca furcræa, *Lacép.* iv. pp. 398, 424.
Corvina furcræa, *Cuv. & Val.* v. p. 111.

D. $10 \,\Big|\, \frac{1}{26\text{–}27}$. A. $\frac{2}{6}$. Cæc. pylor. 4.

The diameter of the eye is one-third of the length of the head. The snout obtuse, with the upper jaw overlapping the lower. No larger teeth in the outer series of the maxillary bone. Præoperculum with distinct spinous teeth, separated from one another. The first ray of the ventral produced into a short filament; the second anal spine rather shorter than the first ray; caudalis pointed, and covered with scales; the second dorsal scaly for half its height. Coloration uniform.

Hab. ——?

14. Corvina axillaris.

Cuv. & Val. v. p. 113, cop. in *Belang. Voy. Ind. Orient. Zool.* p. 356.

D. $10 \,\Big|\, \frac{1}{27\text{–}28}$. A. $\frac{2}{7}$. L. lat. 52. L. transv. $\frac{8}{14}$. Cæc. pylor. 9.

The height of the body is $3\frac{3}{5}$ in the total length, the length of the head nearly four times; the width of the interorbital space is one-third of the latter; the snout is as long as the diameter of the eye, and $4\frac{1}{2}$ in the length of the head. The jaws are nearly equal in front; the cleft of the mouth very oblique, the upper maxillary reaching to below the middle of the eye. The præoperculum has several distinct spines at the angle and its inferior margin; the opercle with two flat spines. Caudalis rounded; the second anal spine is of moderate size, $2\frac{1}{2}$ in the length of the head, and shorter than the first ray; the second dorsal covered high up with scales. The first dorsal blackish, the second grey; a deep-black spot above the axil. Pseudobranchiæ.

Coast of Malabar.

a, b. Half-grown and young. Presented by the Zoological Society.

15. Corvina carutta.

Johnius carutta, *Bl.* tab. 356; *Cant. Catal.* p. 66.
Corvina carutta, *Cuv. & Val.* v. p. 124.
? Corvina carouna, *Cuv. & Val.* v. p. 125.

D. $10 \,\Big|\, \frac{1}{27\text{–}28}$. A. $\frac{2}{7}$. L. lat. 50.

The height of the body is nearly equal to the length of the head,

and is $4\frac{1}{3}$ in the total; the diameter of the eye is one-fourth of the length of the head. The snout is convex, and equal to the width of the orbit, with the upper jaw overlapping the lower. The external series of teeth of the upper jaw is but little larger than the internal; the villiform band of the lower jaw is broader than that of the upper. Præoperculum scarcely crenulated, with a vertical posterior limb. Caudalis convex or rhomboidal; the second anal spine very thick, two-thirds of the length of the first ray. The upper half of the spiny dorsal, from the second to the seventh spine, black; the soft dorsal with four equidistant, large, oblique, black spots; the marginal half of the caudal, anal and ventral fins blackish.

Coast of Malabar; Sea and rivers of Tranquebar and Pondicherry; Sea of Pinang.

a. Half-grown: skin. Sea of Pinang. From Dr. Cantor's Collection.

16. Corvina plagiostoma.

Bleeker, Java, i. p. 100, and *Verhand. Batav. Genootsch.* xxii. *Madura*, p. 10, xxiii. *Sciæn.* p. 17.

D. $10\frac{1}{27-28}$. A. $\frac{2}{7}$. L. lat. 55.

The height of the body equals the length of the head, and is $4\frac{1}{2}$ in the total. The snout obtuse, with the jaws equal, shorter than the diameter of the eye, which is one-third of the length of the head. Cleft of mouth very oblique. Præoperculum slightly denticulated. The pectoral and ventral fins nearly equal in length; the caudal pointed; the second anal spine strong, one-half of the length of the head. Greyish above; the spinous dorsal brown, the soft dorsal and the caudal fins minutely dotted with brown, the other fins yellowish. (*Bl.*)

Sea of Madura.

17. Corvina belangerii.

Corvina belangeri, *Cuv. & Val.* v. p. 120, cop. in *Belanger*, p. 358.
? Corvina kuhlii, *Cuv. & Val.* v. p. 121; *Bleeker, Verhand. Batav. Genootsch.* xxiii. *Sciæn.* p. 18.
Johnius belangeri, *Cant. Catal.* p. 65.
? Corvina sampitensis, *Bleeker, Borneo*, vi. p. 421.

D. $9\text{–}10 \mid \frac{1}{28-30}$. A. $\frac{2}{7}$. L. lat. 48.

The height of the body equals the length of the head, and is one-fifth of the total. The snout is convex, with the upper jaw overlapping the lower, and shorter than the eye, the diameter of which is $3\frac{1}{8}$ in the length of the head. An external series of larger teeth in the upper jaw. Caudalis rhomboidal; the length of the second anal spine is two-thirds or four-fifths of that of the first ray. Back and fins pale brownish; the marginal half of the caudal, anal and ventral fins blackish.

Coast of Malabar; Seas of Pinang, Malayan Peninsula, and Singapore. Borneo (?).

a, b. Half-grown: skins. Sea of Pinang. From Dr. Cantor's Collection.

18. **Corvina lobata.**

Corvina lobata, *Cuv. & Val.* v. p. 122. pl. 107.

D. 9–10 | $\frac{1}{23-31}$. A. $\frac{2}{7}$. Cæc. pylor. 8.

The height of the body equals the length of the head, and is $4\frac{1}{2}$ in the total. Snout convex, with the upper jaw overlapping the lower, and with the cleft of the mouth nearly horizontal. Denticulations of præoperculum not visible. Caudalis rhomboidal. The first ventral ray prolonged into a filament; the length of the second anal spine $2\frac{1}{2}$ in that of the head. Back with five dark cross-bands, fins with blackish margins. (*Cuv.*)

Coast of Malabar.

19. **Corvina semiluctuosa.**

Cuv. & Val. v. p. 97. pl. 106.

D. 10 | 31. A. $\frac{2}{7}$.

The height of the body is nearly equal to the length of the head, and $3\frac{1}{2}$ in the total (in mature specimens). The upper jaw convex, overlapping the lower. Præoperculum scarcely crenulated. The dorsal fins united, with the notch between not very deep; the caudal rounded; the second anal spine strong, but one-fourth shorter than the first ray; the first ray of the ventral fin prolonged, filiform. Greyish-green, with many brown oblique streaks, directed forwards; all the fins brownish-black.

Goa; Pondicherry; China.

a. Young. China. From Dr. Cantor's Collection.

20. **Corvina albida.**

Cuv. & Val. v. p. 93, cop. in *Belanger, Voy. Ind. Orient. Zool.* p. 355.

D. 10 | $\frac{1}{24-25}$. A. $\frac{2}{7}$. L. lat. 75. L. transv. $\frac{7}{19}$.

The height of the body is nearly equal to the length of the head, and $4\frac{1}{2}$ in the total. The snout is rather obtuse, convex, with the jaws equal in front, shorter than the diameter of the eye, which is one-seventh of the length of the head; in both the jaws an outer series of larger teeth. Præoperculum scarcely denticulated, more distinctly in young individuals; suprascapula crenulated, coracoid entire. The ventral and pectoral fins nearly equal in length; the second anal spine strong, one-fifth shorter than the first ray. Caudalis pointed. Coloration uniform, with an indistinct streak along the centre of each scale.

Coast of Malabar; Chinese Sea.

a. Large specimen: stuffed.
b. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
c. Young. India.

21. Corvina jubata.

Bleeker, Borneo, viii. p. 160.

$$\text{D. } 10 \,\Big|\, \frac{1}{22\text{–}23}. \quad \text{A. } \frac{2}{7\text{–}8}. \quad \text{L. lat. } 50.$$

The body is not quite so high as the head is long, the length of which is one-fourth of the total. The snout is convex, obtuse, with the upper jaw longest, shorter than the diameter of the eye, which is $3\frac{2}{3}$–$3\frac{3}{4}$ in the length of the head. An outer series of larger teeth in the maxillary bone. Præ , sub- and interoperculum distinctly denticulated. Scales smooth, entire, except those of the crown and neck, which are provided with prominent bunches of setiform teeth. Caudalis pointed; the second anal spine thick, but only one-half the length of the first ray, or one-fourth of the length of the head. Coloration uniform. (*Bl.*)

Rivers of Bandjermassing (Borneo).

22. Corvina fasciata.

Cheilotrema fasciatum, *Tschudi, Faun. Per. Ichthyol.* p. 13. tab. 1.

$$\text{D. } 10 \,\Big|\, \frac{1}{22}. \quad \text{A. } \frac{2}{9}.$$

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head four times; the diameter of the eye is $1\frac{1}{3}$ in the extent of the snout. Præoperculum with the angle rounded, with the posterior margin nearly vertical, and with some slight denticulations inferiorly. An outer series of larger teeth. Caudal subtruncated; the length of the second anal spine is two-thirds of that of the first ray. Silvery, with indistinct cross-bands. (*Tsch.*)

Caleta of Chancay, between Callao and Huacho. The typical specimen is in the Berlin Museum.

9. OTOLITHUS*.

Otolithus, *Cuv. Règne Anim.*; *Cuv. & Val.* v. p. 59.

Body oblong; muzzle obtuse or slightly pointed, with the lower jaw longer. Two dorsals, the first with nine or ten feeble spines; anal fin with small spines. Conical canine teeth more or less distinct,

* 1. Otolithus versicolor, *Cuv. & Val.* v. 64, from *Russell*, pl. 109; *Cant Catal.* p. 61.—East Indies†.
2. —— virescens, *Cuv. & Val.* v. p. 72.—Surinam.
3. —— aureus, *Richards. Ichth. Chin.* p. 224.—Canton.
4. —— reevesii, *Richards. Ichth. Chin.* p. 224.—Canton.
5. —— nebulosus, *Cuv. & Val.* v. p. 79.—America?
6. —— tridentifer, *Richards. l. c.* p. 225.—China Seas.
7. Johnius aneus, *Bl.* vii. p. 135. taf. 357; Corvina anei, *Cuv. & Val.* v. p. 131. —Tranquebar.

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† A single skin of a young specimen, from Dr. Cantor's Collection, is in the British Museum, but it does not present peculiarities by which the species may be properly distinguished.

either in both the jaws, or in the upper alone. Præoperculum denticulated or crenulate. Scales of moderate size or small. Air-bladder in some with a horn-like process on each side, directed forwards, in others with numerous lateral appendages. Pyloric appendages in small number.

Inhabitants of the tropical seas; some entering fresh waters.

1. **Otolithus æquidens.**

Cuv. & Val. v. p. 66; *Smith, Ill. Zool. S. Afr. Pisces*, pl. 13 (too slender).

$$D.\ 10 \left| \frac{1}{28}.\quad A.\ \frac{2}{8}. \right.$$

The height of the body is one-fifth of the total length, the length of the head one-fourth. Lower jaw longest; teeth in both the jaws in broad card-like bands; the upper maxillary reaches nearly to the posterior margin of the orbit. Præoperculum scarcely denticulated, with the angle rounded and rather projecting. Caudal fin emarginate.

Cape Seas.

a, b. Large specimens: stuffed.

2. **Otolithus senegalensis.**

Cuv. & Val. ix. p. 476.

$$D.\ 10 \left| \frac{1}{29}.\quad A.\ \frac{2}{7}.\quad L.\ lat.\ 45\text{–}50.\quad Cæc.\ pylor.\ 6. \right.$$

The height of the body is one-sixth of the total length, the length of the head one-fourth; the diameter of the eye is one-sixth of the latter. Canine teeth of moderate size. The caudal fin is elongate, pointed, and equals the pectoral in length. Greenish, with narrow oblique streaks or with indistinct spots. (*Val.*)

Coast of Gorea.

3. **Otolithus carolinensis.**

Otolithus carolinensis, *Cuv. & Val.* ix. p. 475; *Dekay, New York Fauna, Fishes*, p. 72; *Holbr. Ichth. S. Carol.* p. 133. pl. 19. f. 2.
Cestreus carolinensis, *Gronov. Syst. ed. Gray*, p. 49.

$$D.\ 10 \left| \frac{1}{27\text{–}28}.\quad A.\ \frac{1}{11\text{–}12}.\quad L.\ lat.\ 80. \right.$$

The height of the body is nearly one-fifth of the total length, the length of the head two-sevenths. No canines in the lower jaw, those of the upper moderate. The upper maxillary does not reach to the posterior margin of the orbit. Præoperculum scarcely denticulated, with the angle rounded and projecting. Caudal nearly truncated. Back and sides, dorsal and caudal fins spotted; anal blackish. Pseudobranchiæ.

a. Adult. New York.

b, c. Adult. From the Haslar Collection.

d.? Fine specimen. Gulf of Mexico. From the Haslar Collection. —A. $\frac{1}{10}$; pectoral shorter than the distance between the eye and the point of the operculum.

e, f. Adult: skins. Pontchartrain Lake. From Dr. Parnell's Collection.
g. Adult: skin. From Gronow's Collection.

4. Otolithus regalis.

Labrus squeteague, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 396. pl. 2. f. 6.
Johnius regalis, *Bl. Schn.* p. 75; *Holbr. Ichthyol. S. Carol.* p. 127. pl. 18. f. 1.
Schoepff, Schrift. Naturforsch. Freunde Berl. viii. p. 169.
Otolithus regalis, *Cuv. & Val.* v. p. 67; *Richards. Faun. Bor. Amer. Fishes*, p. 68; *Dekay, New York Fauna, Fishes*, p. 71. pl. 8. f. 24; *Baird, Ninth Smithson. Report*, p. 329.

D. $9 \mid \frac{1}{29}$. A. $\frac{1}{13}$. L. lat. 60–65. Cæc. pylor. 4. Vert. 14/11.

The height of the body equals the length of the head, and is $4\frac{1}{2}$ in the total. No canines in the lower jaw, those of the upper strong. Præoperculum with small denticulations. The vertical fins covered with scales on a great part of their length. Back with darker oblique streaks, following the transverse series of scales.

Fresh waters of N. America; Martinique.

5. Otolithus analis.

Otolithus analis, *Jenyns, Zool. Beagle, Fishes*, p. 164.
—— peruanus, *Tschudi, Faun. Per. Ichthyol.* p. 10.

D. $9 \mid \frac{1}{22\text{–}24}$. A. $\frac{1}{15\text{–}16}$.

The height of the body is $4\frac{4}{5}$ in the total length; the diameter of the eye $1\frac{1}{2}$ in the length of the snout. The cleft of the mouth extends to below the middle of the eye. No canines in the lower jaw, those of the upper strong; præoperculum smooth and with the angle rounded. Coloration uniform.

Coast of Peru.

6. Otolithus drummondii.

Richards. Faun. Bor. Amer. Fishes, p. 70.

D. $9 \mid \frac{1}{25}$. A. $\frac{1}{8}$. L. lat. 66.

The height of the body is little more than one-sixth of the total length, excluding the caudal. The length of the head is exactly one-fourth of the whole length, including the caudal. The lower jaw projecting beyond the upper; no canines in the lower jaw, those of the upper moderately long. Caudalis rounded; the anal spine slender, and not above one-third of the height of the soft ray which succeeds it. Many small, roundish, blackish-brown spots on the back, above the lateral line, and on the second dorsal and caudal fins. (*Rich.*)

New Orleans.

7. Otolithus thalassinus.

? *Holbr. Ichth. S. Carol.* p. 132. pl. 18. f. 2.

D. $9 \mid \frac{1}{24}$. A. $\frac{1}{11}$. L. lat. 73. Cæc. pylor. 4.

The height of the body is $5\frac{1}{3}$ in the total length, the length of the head $3\frac{4}{5}$; the diameter of the eye is $6\frac{1}{2}$ in the latter; the upper jaw reaches to the posterior margin of the orbit. The lateral line very slightly bent downwards in the middle of its length. The lower jaw is the longer; præoperculum with the angle rounded and projecting, scarcely denticulated. Caudal fin truncated. Above dusky, sides and belly yellowish, fins immaculate. Pseudobranchiæ.

Sea of Charleston Bar; Gulf of Mexico.

a. Fine specimen. Gulf of Mexico. From the Haslar Collection.

8. Otolithus leiarchus.

Cuv. & Val. v. p. 78.

D. $9 \mid \frac{1}{21-23}$. A. $\frac{1}{11}$. L. lat. 120.

The height of the body is $4\frac{2}{3}$ in the total length, the length of the head $3\frac{3}{4}$; the diameter of the eye is nearly one-eighth of the latter. No canines in the lower jaw, those of the upper moderate. The upper maxillary reaches nearly to the posterior margin of the orbit; lower jaw very projecting. Præoperculum scarcely denticulated, with the angle rounded and projecting. Pseudobranchiæ. Caudal fin truncated. Coloration uniform.

South America.

a. Adult. Bahia. Purchased of M. Parzudaki.
b. Fine specimen. S. America.
c. Adult: stuffed.

9. Otolithus nothus.

Holbr. Ichth. S. Carol. p. 134. pl. 19. f. 1.

D. $10 \mid \frac{1}{24-25}$. A. $\frac{1}{9}$. L. lat. 60. Cæc. pylor. 4.

The height of the body is $4\frac{1}{2}$ in the total length, the length of the head $3\frac{4}{5}$. The snout is somewhat pointed, with the lower jaw prominent, but rather short, a little longer than the diameter of the eye, which is one-fifth of the length of the head. The upper maxillary reaches to below the middle of the orbit. The lateral line strongly curved downwards, below the notch of the dorsal fin. Præoperculum with the angle rounded and projecting, not denticulated. Caudal fin with an oblique notch. Coloration uniform, back with indistinct oblique streaks.

Coast of S. Carolina; Caribbean Sea.

a, b. Adult: skins. Jamaica. From Dr. Parnell's Collection.

Although Holbrook gives twenty-eight rays for the dorsal fin, I do not hesitate to refer our specimens to this species, the general form of all the parts being exactly the same.

10. **Otolithus cayennensis.**

Lutjanus cayennensis, *Lacép.* iv. pp. 196, 245.
Cheilodipterus akoupa, *Lacép.* iii. p. 546.
Otolithus toeroe, *Cuv. & Val.* v. p. 72. pl. 103, ix. p. 478.

D. 10–11 | $\frac{1}{19-20}$. A. $\frac{2}{8}$. Cæc. pylor. 4. Vert. 14/11.

The height of the body is 4½ in the total length, the length of the head four times. No canines in the lower jaw, those of the upper of moderate size. Caudalis pointed; the second anal spine not one-half the length of the first ray. The upper maxillary reaching to the posterior margin of the orbit. Pseudobranchiæ none.

Atlantic coasts of Tropical America; Lake of Maracaïbo.

a, b. Adult. West Indies.

11. **Otolithus guatucupa.**

Guatucupa, *Marcgr.* p. 177.
Otolithus guatucupa, *Cuv. & Val.* v. p. 75. pl. 104; *Jenyns, Zool. Beagle, Fishes*, p. 41.

D. 10 | $\frac{1}{18-20}$. A. $\frac{1}{8}$. Cæc. pylor. 4.

The height of the body is contained 4½ in the total length, the length of the head 3½; the diameter of the eye is one-fifth of the latter. Snout pointed, much longer than the diameter of the eye, with the lower jaw projecting; canines in the upper jaw only, of moderate size. The margin of the præoperculum with a few indistinct striæ and obsolete denticulations. Caudalis truncated. Above greenish; sides silvery, with brownish cross-streaks, descending obliquely from the back towards the front.

Atlantic coasts of South America; Maldonado Bay, Rio Plata.

12. **Otolithus ruber.**

Johnius ruber, *Bl. Schn.* p. 75. pl. 17 (coloration bad).
Otolithus ruber, *Cuv. & Val.* v. p. 60. pl. 102; *Cant. Catal.* p. 59.

D. 10 | $\frac{1}{29-30}$. A. $\frac{1}{7}$. L. lat. 60. Cæc. pylor. 4.

The height of the body is 4½ to 4¾ in the total length, the length of the head 3½; the diameter of the eye is one-sixth of the latter. Canines of both the jaws strong; præoperculum indistinctly denticulated. Caudal fin pointed, but becoming more rounded with age. Coloration uniform.

Coasts of Coromandel, Malabar, and Malayan Peninsula.

a. Adult: skin. Malayan Peninsula. From Dr. Cantor's Collection.

b. Adult: stuffed. Kurrachee. From the Collection of Messrs. von Schlagintweit.

13. Otolithus argenteus.

Otolithus argenteus, *(Kuhl & v. Hass.) Cuv. & Val.* v. p. 62; *Richards. Ichth. China*, p. 225; *Bleek. Verhand. Batav. Genootsch.* xxiii. p. 15.
? Sciæna japonica, *Faun. Japon.* p. 58. pl. 24. f. 1 (bad).

D. 10 $\left|\frac{1}{25-28}\right.$. A. $\frac{2}{7}$. L. lat. 70. Cæc. pylor. 6.

The height of the body is $5\frac{4}{5}$ in the total length, the length of the head $4\frac{1}{2}$; the diameter of the eye is $6\frac{1}{3}$ in the latter. Canines in both the jaws very strong. Præoperculum with very small denticulations; fins not covered with scales, except a narrow continuation of the lateral line on the caudal fin. Anal spine very feeble, one-third of the length of the first ray. Caudal pointed. Coloration uniform. Pseudobranchiæ.

Chinese, Javanese, and Ceylonese Seas; coast of Malabar.

a. Half-grown. China.
b. Adult: stuffed: not good state. China. Presented by J. R. Reeves, Esq.
c. Adult: skin: not good state. Ceylon. Presented by E. F. Kelaart, M.D.
d. Large specimen: stuffed. From the Collection of the East India Company.
e. ? Adult: skin: not good state. Presented by B. H. Hodgson, Esq.

14. Otolithus maculatus.

Otolithus maculatus, *(Kuhl & v. Hass.) Cuv. & Val.* v. p. 64; *Cantor, Catal.* p. 62; *Cuv. Règne Anim. Ill. Poiss.* pl. 27. f. 2; *Bleek. Verh. Batav. Genootsch.* xxiii. *Sciæn.* p. 15.

D. 10 $\frac{1}{34}$. A. $\frac{2}{11}$.

The height of the body is $5\frac{1}{2}$ in the total length, the length of the head $3\frac{3}{4}$; the diameter of the eye is a little more than one-sixth of the latter. Canines in both the jaws strong; the lower jaw projects considerably beyond the upper. Caudal fin nearly rounded in the adult. Back and upper part of the sides with brownish spots, the scales of each spot edged with black; fins minutely dotted with brown; single, large, irregular black spots scattered over the caudal fin.

Seas and estuaries of Pinang, Malayan Peninsula, Singapore, and Batavia.

a. Adult: skin. Malayan Peninsula. From Dr. Cantor's Collection.

15. Otolithus bispinosus.

Cuv. & Val. v. p. 65.

D. 9 $\left|\frac{1}{31}\right.$. A. $\frac{2}{10}$.

Præoperculum with two spines at the angle, besides the usual denticulations. Caudalis very elongate and pointed. Coloration uniform. (*Cuv.*)

Rangoon.

a. Young.

16. Otolithus microlepidotus.

Cuv. & Val. v. p. 79.

D. $9\,\Big|\,\frac{1}{24}$. A. $\frac{2}{9}$. L. lat. 160.

The scales covering the operculum twice as large as the others; the lower jaw projecting beyond the upper. Caudalis rounded; the second dorsal and anal fins thickly covered with small scales. (*Cuv.*)

Surinam (Berlin Museum).

17. Otolithus lateoides.

Bleeker, Java, i. p. 98, and *Verh. Batav. Gen.* xxiii. *Sciæn.* p. 16.

D. $10\,\Big|\,\frac{1}{25\text{–}26}$. A. $\frac{2}{7\text{–}8}$. L. lat. 100.

The height of the body is rather less than one-fifth of the total length, the length of the head two-ninths. The snout is not obtuse, and nearly equals in length the diameter of the eye, which is one-sixth of the length of the head; the lower jaw longest; canines in both the jaws, of moderate size. Præoperculum scarcely denticulated. The caudal fin elongate, pointed. Coloration uniform: the dorsal fins spotted with brown; the spots of the second dorsal arranged in two longitudinal series. (*Bl.*)

Sea of Batavia.

This species is now referred by Bleeker himself to *Otolithus argenteus* (Natuurk. Tydschr. Nederl. Ind. 1858, xv. p. 375), in which opinion I cannot concur, because the latter species appears to have larger scales.

10. ANCYLODON.

Ancylodon, *Cuv. & Val.* v. p. 80.

Body oblong; muzzle with the lower jaw projecting and the cleft of the mouth oblique. Two dorsals, scarcely united or entirely separated; the first with seven or nine feeble spines; anal spines feeble. Very long canine teeth, arrow-shaped or lanceolate. Præoperculum crenulated. Scales small. Air-bladder with a horn-like process on each side, directed forwards. Pyloric appendages in small number.

Atlantic coasts of Tropical America.

1. Ancylodon jaculidens.

Lonchurus ancylodon, *Bl. Schn.* p. 102. pl. 25.
Ancylodon jaculidens, *Cuv. & Val.* v. p. 81.

D. $9\,\Big|\,\frac{1}{28\text{–}29}$. A. $\frac{1}{9\text{–}10}$. Cæc. pylor. 3–4. Vert. 15/11.

Lower jaw very prominent. Caudalis pointed. Back greyish; sides silvery, with indistinct darker oblique cross-streaks.

Atlantic coasts of Tropical America.

a. Fine specimen. Surinam.
b. Adult. South America. Presented by Sir R. Schomburgk.

c. Adult: skeleton. South America. Presented by Sir R. Schomburgk.
d–h. Adult and half-grown. West Indies.
i. Adult: stuffed: not good state.
k. Intestines of specimen *c*.

The *air-bladder* is oblong, tapering to a long filiform point behind; anteriorly it terminates in two slender horns, the length of which is one-eleventh only of the entire length of the bladder. It is attached to a prominence of the third vertebra.

2. Ancylodon parvipinnis.

Cuv. & Val. v. p. 84. pl. 105.

D. $7 \left| \frac{1}{17} \right.$. A. $\frac{2}{18}$. Cæc. pylor. 4. Vert. 10/14.

The lower jaw very prominent. The two dorsals separated from each other by an interspace equal to the length of the first; the first dorsal much lower than the second. Caudalis truncated, or slightly rounded. Coloration uniform. (*Cuv.*)

Cayenne.

11. COLLICHTHYS.

Sciæna, sp., *Cuv. & Val.* v. p. 55; *Richards. Ichth. Voy. Sulph.* p. 87.
Otolithus, sp., *Cantor, Catal.* p. 57.

Body elongated; head very broad, with the upper part very convex; muzzle wide, very oblique; eye small. No large canines; no barbel. The second dorsal very elongate; caudal pointed. The second spine of the anal feeble. Pseudobranchiæ none. Air-bladder with a horn-like process on each side, or with many appendages, anastomosing with one another; number of the pyloric appendages moderate.

East Indian Seas.

1. Collichthys lucida.

Sciæna lucida, *Richards. Ichth. Voy. Sulph.* p. 87. pl. 44. f. 3, 4.

D. $9 \left| \frac{1}{33} \right.$. A. $\frac{2}{8}$. L. lat. 75. L. transv. $\frac{10}{20}$. Cæc. pylor. 13. Vert. 11/18.

The height of the body is $4\frac{1}{2}$ in the total length, the length of the head four times; the diameter of the eye is nearly one-fifth of the length of the head, and equals the length of the snout; the upper maxillary reaches to behind the level of the posterior margin of the orbit. The denticulations of the præoperculum feeble and flexible; operculum and suboperculum not notched at their lower margins. Caudal fin elongate, pointed.

Chinese Sea.

a. Fine specimen. China. Presented by J. R. Reeves, Esq.
b. Adult. China. Presented by Sir John Richardson.
c. Adult. China. Presented by Sir John Richardson.

d. Adult: skin: bad state. China. Presented by J. R. Reeves, Esq.
e. Half-grown. China.
f. Young. China.
g. Half-grown. China. From Dr. Cantor's Collection.
h. Young. China. From Dr. Cantor's Collection.
i. Half-grown. China. From the Collection of the East India Company.
k. Half-grown. Chusan. Presented by the East India Company.
l–n. Half-grown and young. India. Presented by G. R. Waterhouse, Esq.
o–q. Adult. From the Haslar Collection.
r. Adult female: skeleton: not good state.
s. Air-bladder of specimen *r.*

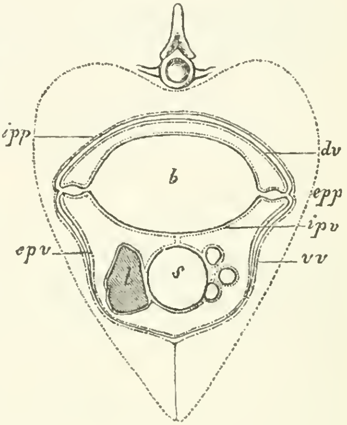
Anatomy.—The intestinal tractus does not show any peculiarity. The stomach is a long cæcal sac, with thirteen appendages at the pyloric opening; the intestines form a flexure behind, and another more anteriorly; the liver has a longer lobe on the left side, and a shorter one on the right. The ovaria are elongate, cuneiform, united at their posterior extremity, and contain a very great number of small ova.

The *air-bladder* (*b*) has an exceedingly delicate and complicated structure: its body is elongate, cuneiform, rather depressed, with pointed posterior extremity; the membrane is thick and stiff. At the anterior extremity of the dorsal side, a cordiform impression is visible, corresponding to a cartilaginous heart-shaped plate of the third and fourth vertebræ; to this plate the air-bladder is firmly attached. The air-bladder emits on each side twenty-five cuneiform appendages, contracted at their base, and tapering at the other end; the anterior ones are directed towards the front, but the lateral ones assume a more posterior direction the nearer they are to the posterior extremity of the air-bladder, where they have the appearance of the cauda equina of the spinal chord. All these appendages or air-vessels soon bifurcate in a dorsal and in a ventral stem; these stems bifurcate again and again, and either terminate after the first or second bifurcation, or are so far prolonged as to reach the median line of the ventral and dorsal side, anastomosing with the branches of the other side. All these branches are now enveloped in laminæ of the peritoneum, forming a dorsal and a ventral sac of a beautiful appearance, which is caused by the regular arrangement of the air-vessels.

Before describing the detailed relation of these sacs to the different laminæ of the peritoneum, I shall give a short view of their situation. The dorsal sac is situated between the air-bladder and the roof of the abdominal cavity; it is attached to the sides of the air-bladder only, and has no connexion at all with the vertebral column; it is very thick, and formed by two laminæ of the peritoneum, by a thick intermediate stratum of cellular tissue, and by air-vessels. The ventral sac receives in its cavity all the abdominal intestines —intestinal tractus, liver, ovaria; and we have here the remarkable fact of *an air-bladder not only occupying the dorsal part of the abdominal cavity, but covering all its interior surface by a system of air-*

vessels. This ventral sac lies free round the intestines, and is fixed by a peritoneal fold along the medial line of the abdomen.

The way in which the peritoneum forms the base of the dorsal and ventral system of air-vessels is the following, and will be illustrated by the accompanying schematic sketch, giving a view of a cut, made on the level of the posterior third of the stomach.



We may distinguish a *parietal* and a *visceral* part of the peritoneum, each being separated into two *laminæ*, an external and an internal.

1. *Peritoneum parietale.*

a. The external lamina (*e p p*) merely covers the inside of the abdominal cavity and the kidneys, which are situated outside the peritoneal sac; it is shining silvery, soft, and very easily torn; in the median line of the ventral side it turns inside, forming a fold of stronger structure, by which the ventral sac of the system of air-vessels is fixed, and which passes,

b, into the internal lamina of the peritoneum parietale (*i p p*). This part of the peritoneum has, like all the following, the structure and firmness of a common serous membrane. It forms the outer part of the ventral and dorsal sacs, being uninterrupted. and nowhere pierced by air-vessels.

2. *Peritoneum viscerale.*

a. The lamina interna (*i p v*) covers all the abdominal intestines, stomach (*s*), liver (*l*), &c., fixing them to one another by folds, as usual, and surrounding the air-bladder on all sides. Now, enveloping each of the appendages, and following them to their first bifurcation, it passes,

b, into the lamina externa of the peritoneum viscerale (*e p v*): one part forms the inner side of the ventral sac, the other that of the dorsal. Thus the visceral peritoneum is pierced by as many holes as there are appendages of the air-bladder. Where the immediate connexion between the visceral and the parietal peritoneum is, I could not find; but the principal point which I wish to show is, that both the ventral and dorsal sacs are formed by a lamina of the visceral and by another of the parietal peritoneum. The air-vessels are imbedded between these laminæ—the dorsal vessels (*d v*) as well as the ventral (*v v*)—in a stratum of cellular tissue, which on the dorsal side is so thick, that it might be taken for a part of the air-bladder itself, whilst in fact the small vessels only are in immediate contact with the air-bladder. The ventral sac shows the same structure, but the stratum of cellular tissue is thinner. Whilst the dorsal sac is situated immediately on the back of the air-bladder, the ventral receives the intestines in its cavity.

Skeleton.—Owing to the bad condition of the skeleton, it is impossible to give a full description of it. Many bones are so thin, that they are more like membranes; and great portions of them, as for instance of the frontal bones forming the roof of the skull, are really replaced by membranes. As in all true *Sciænidæ*, the body of the skull is furnished by a superstructure of bony plates and bars, which, arranged with architectonic symmetry, support the skin which covers the whole, and form deep and regular cavities. I need not describe the single cavities in this species, as they are very similar to those of *Collichthys pama*, figured by Cuvier*. The intermaxillary is elongate, lanceolate, without any prominent posterior process; the maxillary has a round open space, not ossified in its posterior half. The vomer is situated more posteriorly than in those fishes which have this bone armed with teeth; it does not project into the cavity of the mouth, but is excavated,—a form, which, for systematical arrangement, is much more important than the absence or presence of vomerine teeth: a vomer with this structure is never armed with teeth. The palatine bones are thin, short and broad, and have a very delicate free margin. . The lower part of the brain-capsule is remarkably large and globular.

There are eleven abdominal and eighteen caudal *vertebræ*, the length of the former portion of the column being to that of the latter as 1 : 1·75. The third vertebra is furnished inferiorly with a pair of porous processes, forming together a broad knob, to which the air-bladder is fixed. The interhæmal for the anal spines is slender, feeble, and suspended at the hæmal of the twelfth vertebra.

2. Collichthys biaurita.

Otolithus biauritus, *Cantor, Catal. Malay. Fishes*, p. 57; *Bleek. Act. Soc. Sc. Indo-Nederl.* iii. *Borneo*, p. 3.

$$D.\ 9\left|\frac{1}{27\text{–}32}.\right.\quad A.\ \frac{2}{7}.$$

The height of the body is $6\frac{1}{3}$ in the total length, the length of the head $4\frac{1}{2}$–$4\frac{1}{5}$; the diameter of the eye is only one-eighth of the length of the head. The upper jaw convex, overlapping the lower; in both the jaws are larger teeth in the outer row, but canine-like teeth are distinct in the upper only. Opercular region with two skinny lobes, the lower of which envelopes the two bony points of the opercle. The posterior limb of the præoperculum very indistinctly crenulated. Caudal very elongate and pointed, with the middle rays very broad · the second anal spine scarcely one-half the length of the first ray. Coloration uniform; in adult specimens a deep-black spot in the axil, in younger ones a bluish-black spot on the upper half of the operculum.

Seas of Chusan, Pinang, Malayan Peninsula, Singapore, and Borneo; Tenasserim coast.

a, b. Two large specimens: stuffed: not good state. From the Collection of the Zoological Society.

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* *Cuv. & Val.* v. pl. 140. figs. 3 & 4.

c. Adult: stuffed.
d. Three feet long: stuffed. Sea of Pinang.
e. Three feet long: stuffed. Calcutta. From Mr. E. Blyth's Collection.
f. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.
g, h. Young: skins. Malayan Peninsula. From Dr. Cantor's Collection.

3. **Collichthys pama.**

Bola pama, *Buch. Ham. Gang. Fishes,* pp. 79, 368. pl. 32. f. 26.
Sciæna pama, *Cuv. & Val.* v. p. 55. pl. 101; *Bleek. Verh. Bat. Gen.* xxv. p. 92.

D. $10 \,\big|\, \frac{1}{40\text{–}43}$. A. $\frac{2}{7}$. L. lat. 70. Vert. 24. Cæc. pylor. 9.

The height of the body is 5–$5\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{2}$–$4\frac{2}{3}$; the diameter of the eye is one-eighth of the latter, or one-half the length of the snout; the upper maxillary reaches to behind the posterior margin of the orbit. Caudalis elongate, pointed. Opercular region with two skinny lobes.

Bay of Bengal, entering rivers.

a. Adult. Calcutta. Presented by G. R. Waterhouse, Esq.
b. Half-grown. Calcutta. Presented by G. R. Waterhouse, Esq.
c. Adult: stuffed: not good state. Bay of Bengal. From the Collection of the Zoological Society.
d, e. Adult: stuffed. India.
f–h. Young. India. Presented by G. R. Waterhouse, Esq.
i. Adult: stuffed: not good state. East Indies. From the Collection of the East India Company.

12. **NEBRIS.**

Nebris, *Cuv. & Val.* v. p. 149.

Body oblong; muzzle with the lower jaw prominent; eye small. Two dorsals, the first with eight feeble spines; the anal with two thin spines. All the teeth villiform. Præoperculum with a scaleless, striated membrane behind. Scales small. Air-bladder with two very long horns. Pseudobranchiæ?*

Surinam.

1. **Nebris microps.**

Cuv. & Val. v. p. 149. pl. 112.

D. $8 \,\big|\, \frac{1}{31}$. A. $\frac{2}{9}$. L. lat. 85. L. transv. 30.

The height of the body is $4\frac{2}{3}$ in the total length, the length of the head four times; the diameter of the eye is one-tenth of the latter. The snout is obtuse, not very short, with the lower jaw projecting beyond the upper; the upper maxillary reaches to the posterior margin of the orbit. All the teeth villiform. Præoperculum with a scaleless, flexible membrane behind, striated and minutely denticulated. Fins partly covered with thin scales; the anal spine feeble; caudalis pointed. Coloration uniform. (*Cuv.*)

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* We may infer, from the other *Sciænidæ* which are the closest allied to *Nebris*, that the pseudobranchiæ are absent.

Surinam.

13. LONCHURUS.

Lonchurus, sp., *Bloch, Schneid.* p. 102.
Lonchurus, *Cuv. & Val.* v. p. 192.

Body elongate; muzzle obtuse, with the upper jaw overlapping the lower; eye small; mandibula with two barbels. Two dorsals, the first with ten or eleven feeble spines, the anal with two; the pectoral and caudal fins very elongate. Scales moderate. Pseudobranchiæ none; air-bladder with several long horns; pyloric appendages in small number.

Atlantic coasts of Tropical America.

1. Lonchurus lanceolatus.

Perca lanceolata, *Bloch in Nov. Act. Soc. Sc. Copenh.* iii. p. 383.
Lonchurus barbatus, *Bl.* tab. 360; *Bl. Schn.* p. 102; *Cuv. & Val.* v. p. 193.

D. $11 \mid \frac{1}{37}$. A. $\frac{2}{9}$. L. lat. 70.

The pectoral fin elongate, reaching far behind the vent; caudal very long and pointed; ventral elongate. (*Bl.*)

Surinam.

The descriptions given by the authors above referred to appear to me to have been made from a mutilated specimen of the fish, which in my opinion is the *Lonchurus depressus* of Schneider.

2. Lonchurus depressus.

Bloch, Schneid. p. 102.

D. $10 \mid \frac{1}{40}$. A. $\frac{2}{8}$. L. lat. 60. L. transv. $\frac{5}{17}$. Cæc. pylor. 4. Vert. 10/19.

The upper ray of the pectoral fin very elongate, filiform, and reaching nearly to the root of the caudal fin; caudal elongate and terminating in a point; the first ray of the ventral elongate, filiform, and reaching to the root of the anal fin. Fins blackish; pectoral and caudal fins black.

a. Adult. West Indies.
b. Adult. West Indies.
c. Adult female: skeleton. West Indies.
d. Half-grown. West Indies.

Pseudobranchiæ none. The form of the *air-bladder* is very peculiar: we may distinguish in it a body and five horns. The body is short, heart-shaped, and occupies a place beneath the third and fourth vertebræ only; its point is continued into the middle horn, which in a fish 9 inches long has a diameter of only half a line near its origin; it runs along the vertebral line of the abdominal cavity, and tapering to a fine point, terminates at the posterior extremity of the abdomen. Each of the anterior parts of the heart-shaped body is divided into two horns, the posterior of which is turned backwards, long, and forms a tube similar to the median, but with the lumen only half as wide; it runs along the side of the latter, in a parallel direction, and terminates in a fine point before reaching the extremity of the abdomen. The anterior horn is very short, directed forwards and outwards, and nearly as thick as the median.

The body of the air-bladder is attached to the fourth vertebra, and the nearest parts of the abdomen, by such a firm and dense cellular tissue, of a white colour, that it can scarcely be distinguished from the membrane of the air-bladder. At some distance from the vertebra it becomes gradually thinner, and is lost in the parietal part of the peritoneum. The membrane of the air-bladder itself is firm, thick, and of a shining white colour, except in the anterior notch of the heart-shaped body, opposite a process arising from the third vertebra. This process forms an arched plate, open at its posterior side, which is directed towards the notch of the air-bladder; at the side which is directed towards the belly, it is covered by a thick white membrane, forming a sort of cupola, but with the hinder side open. This cupola fits exactly into the notch of the air-bladder, which is here closed by a very thin membrane only. There is a string round the cupola from one anterior horn to the other, to fasten the air-bladder to the process.

The *skeleton* is not in a good state of preservation. The following peculiarities may be observed:—The upper surface of the skull is rather flat on its posterior half, the occipital crest not extending on the crown. The muciferous cavities are well developed, but not very deep; there is a large elongate central cavity, and six or seven pairs of smaller ones besides. The orbit is smaller than in any of the preceding fishes; the infraorbital arch is broad, and produced backwards towards the angle of the præoperculum. The anterior half of the maxillary bone is styliform, the posterior very broad: the intermaxillary resembles the maxillary, but is shorter and much more slender; its posterior processes are unusually broad, as in *Micropogon*. The vomer is concave, tapering posteriorly. The glossohyal styliform.

There are ten abdominal and nineteen caudal *vertebræ*, the length of the former portion of the column being to that of the caudal as 1 : 2·8.

No molar teeth on the pharyngeal bones; several scarcely longer teeth in the outer series of the maxillary bone.

Fam. 13. POLYNEMIDÆ.

Percoidei, pt., *Cuv. Règne Anim.* and *Cuv. & Val. Hist. Nat. des Poiss.* iii. p. 362; *Müller, Berl. Abhandl.* 1844, p. 201.
Polynemidæ, pt., *Richards.*

Body compressed and oblong, covered with scales, feebly ciliated or without serrature. Lateral line continuous, continued on the tail. Mouth at the lower side of the snout, with lateral cleft. Eye lateral, large. Seven branchiostegals; pseudobranchiæ. Villiform teeth in the jaws and on the palate. Two separate dorsals,—the second, the caudal, and the anal fin more or less covered with minute scales. *Several filiform appendages below the pectoral fin, entirely free and articulated.* Ventrals thoracic, with one spine and five rays. The bones of the head with the muciferous system well developed. Air-bladder varying in form and structure, and sometimes wanting.

Tropical regions of the Atlantic; East Indian Seas, to the Pacific. Entering rivers.

Synopsis of the Genera.

Vomerine teeth; the anal equals the soft dorsal	1. POLYNEMUS.
The anal much longer than the soft dorsal.........................	2. PENTANEMUS
No vomerine teeth; the anal equals the soft dorsal	3. GALEOIDES

1. POLYNEMUS*.

Polynemus, *L. Syst. Nat.* i. p. 521.
Polynemus, sp., *Cuv. & Val.* iii. p. 362.

Two separate dorsals, the first with seven or eight spines; all the spines feeble; the soft dorsal and the anal fin nearly equal. In both jaws, on the vomer, the palatine and pterygoid bones, bands of villiform teeth. Præoperculum serrated. Scales moderate or rather small. Pyloric appendages sometimes in immense number. Air-bladder of variable structure and size, if present.

East Indian Seas and South Sea. Tropical parts of the Atlantic. Entering rivers.

* 1. Polynemus microstoma, *Bleeker, Celeb.* i. p. 217.—Sea of Bulucomba.
2. —— diagrammicus, *Bleeker, Perc.* p. 60.—Batavia.

1. Polynemus multifilis.

Polynemus multifilis, *Schleg. Faun. Japon. Poiss.* p. 29, and *Bydrage tot de dierkunde*, 1851, p. 12, cum tab.
—— quatuordecimfilis, *Pel, Bydrage tot de dierkunde*, 1851, p. 9.
—— polydactylus, *Bleeker. Borneo*, vi. p. 417.

D. 7–8 $\Big| \frac{1}{15}$. A. $\frac{3}{12}$. L. lat. 100.

Fourteen pectoral appendages, the upper of which are more than twice the length of the body.

Rivers and South coast of Borneo.

2. Polynemus octonemus.

Girard, Proc. Acad. Nat. Sc. Philad. 1858, p. 167.

Eight free pectoral appendages, the tip of the longest of which extends beyond the origin of the anal fin. (*Gir.*)

Texas.

3. Polynemus paradiseus.

Edwards, Av. p. 208. t. 208; *Russell*, ii. f. 185.
Polynemus paradiseus, *L. Syst. Nat.* i. p. 1401 [not *Bloch*].
Polynemus, no. 398, *Gronov. Zoophyl.*
—— risua, aureus ?, toposui ?, *Buch. Ham. Gang. Fishes*, p. 228.
—— longifilis, *Cuv. & Val.* iii. p. 365, vii. p. 512; *Bleeker, Borneo*, ii. p. 268, and *Borneo*, vi. p. 418.

D. 7 $\Big| \frac{1}{15}$. A. $\frac{2}{12}$. L. lat. 67. L. transv. 6/14. Cæc. pylor. 10. Vert. 10/15.

Seven free pectoral appendages, the upper of which are exceedingly long, much longer than the body. The length of the upper maxillary is $2\frac{1}{3}$ in that of the head. Ventrals yellow.

East Indian Seas, entering rivers.

a. Adult. India.
b. Adult. India.
c. Adult female. India.
d–g. Half-grown. India. From the Haslar Collection.
h–k. Half-grown. India. Presented by G. R. Waterhouse, Esq.
l. Half-grown. Calcutta. From the Collection of Messrs. von Schlagintweit.
m. Half-grown: stuffed: bad state. Calcutta. From the Collection of the East India Company.
n. Half-grown. Ganges. Presented by the Zoological Society.
o. Half-grown. Bengal. From the Collection of the East India Company.
p. Fine specimen. Siam. From M. Mouhot's Collection.
q. Adult: stuffed: bad state.

Air-bladder none.

4. Polynemus macronemus.

Bleeker, Borneo, vi. p. 419.

D. $8 \mid \frac{1}{16}$. A. $\frac{3}{12}$. L. lat. 65.

Seven free pectoral appendages, the upper of which are much longer than the body. The length of the upper maxillary is $1\frac{3}{4}$–2 in that of the head. Ventrals black.

Coasts and rivers of Borneo.

5. Polynemus melanochir.

? Polynemus melanochir, *Cuv. & Val.* vii. p. 513.
Polynemus melanochir, *Bleeker, Perc.* p. 60.

D. $8 \mid \frac{1}{12}$. A. $\frac{3}{14}$. L. lat. 35–40.

Seven pectoral appendages, reaching to the caudal. Fins with blackish dots; the spinous dorsal and the pectorals blackish. (*Bl.*)

Sea of Batavia.

6. Polynemus heptadactylus.

Cuv. & Val. iii. p. 390; *Bleeker, Perc.* p. 60; *Cantor, Catal.* p. 34.

D. $7 \mid \frac{1}{12}$. A. $\frac{3}{12}$. L. lat. 50. L. transv. 5/12. Cæc. pylor. 4.

Seven pectoral appendages of moderate length. The distance between the root of the ventral and the origin of the anal is equal to, or rather more than, that between the posterior nostril and the bony point of the operculum. Pectorals black.

East Indian Seas.

a. Half-grown. Madras. Presented by T. C. Jerdon, Esq.
b. Young: very bad state. Madras. Presented by T. C. Jerdon, Esq.
c. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.
d. Half-grown. Kurrachee. From the Collection of Messrs. von Schlagintweit.
e. Half-grown. Moluccas. From Mr. Frank's Collection.

Air-bladder none.

7. Polynemus plumieri.

Marcgrave, p. 176.
Polynemus paradiseus, *Bloch*, taf. 402; *Bl. Schn.* p. 18.
Polydactylus plumieri, *Lacép.* v. pl. 14. f. 3.
Polynemus americanus, *Cuv. & Val.* iii. p. 393.

D. $8 \mid \frac{1}{12}$. A. $\frac{2}{12\text{–}13}$. L. lat. 57–60. L. transv. 6/10.
Cæc. pylor. ca 13. Vert. 10/14.

Seven pectoral appendages of moderate length. The distance between the root of the ventral and the origin of the anal is less than that between the posterior nostril and the bony point of the operculum. The villiform teeth of the palatine and pterygoid bones form a broad band. Pectoral black.

Caribbean Sea.

a. Adult. S. Domingo. From Mr. Cuming's Collection.
b. Adult male: skeleton. S. Domingo. From Mr. Cuming's Collection.
c. Half-grown. S. Domingo. From Mr. Cuming's Collection.
d–i. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
k. Young. West Indies.
l, *m*. Half-grown. South America. From Mr. Brandt's Collection.
n. Adult. Sine patria. From the Haslar Collection.

Air-bladder simple.

Skeleton.—The bones of the skull are thin and frail, with the system of the muciferous channels moderately developed. There are five crests on the upper surface of the crown: the occipital crest, not extending beyond the occipital bone, triangular and moderately elevated; the lateral pair, diverging from the middle of the interorbital space towards the interior process of the suprascapula; the outer pair, running from the posterior angle of the orbit towards the exterior process of the suprascapula. The anterior part of the principal frontal bones is provided with several openings, leading into muciferous channels in the interior of the bones. The infraorbital ring contains scarcely any ossifications. The maxillary is styliform in its basal half, and gradually widens posteriorly; the intermaxillary is as long as the maxillary, slender, styliform, with a narrow band of minute teeth, and with the posterior processes ascending in an oblique outward direction. The mandibula is feeble, with a wide cleft between the dentary and articulary bones. The head of the vomer is slightly swollen, toothed. The præoperculum is narrow, with a short inferior limb, and with the muciferous channel rudimentary; it is armed with a small flat spine at the angle, and with a distinct serrature along its posterior margin. The operculum is triangular, with a slight ridge on its inner surface.

There are ten abdominal and fourteen caudal *vertebræ*; their apophyses are feeble; the first interneural of each of the dorsal fins is slightly compressed.

8. **Polynemus oligodon.**

D. $8 \mid \frac{1}{13}$. A. $\frac{2}{15}$. L. lat. 70. L. transv. 7/14.

Seven pectoral appendages of moderate length. The distance between the root of the ventral and the origin of the anal is less than that between the posterior nostril and the point of the operculum. The villiform teeth of the palatine and pterygoid bones form a narrow band. Pectoral and top of the first dorsal black.

Atlantic coasts of Tropical America.

a. Adult. Rio Janeiro. Presented by A. Fry, Esq.
b. Adult: skin. Jamaica. From Dr. Parnell's Collection.

Description.—This is a third species of American *Polynemidæ*, one of which only was believed to occur in the tropical parts of the Atlantic. It is generically different from *Pentanemus quinquarius*, and may be readily distinguished from *Polynemus plumieri* by the greater number of anal rays and by the narrow bands of the teeth on the palate.

The fish is moderately elongate; its greatest height is between the second dorsal and the anal, and one-fourth of the total length; the tail is compressed and rather elevated, its height, above the end of the anal, being $7\frac{1}{2}$ in the total length. The head is much longer than high; its length is $4\frac{3}{4}$ in the total; its width between the eyes is nearly one-fourth of its length. The snout is produced, obtusely conical, and as long as the diameter of the eye, which is $4\frac{1}{4}$ in the length of the head. The cleft of the mouth is situated at the inferior side of the head, as usual; it is wide, the upper maxillary reaching far behind the orbit, and its length being $2\frac{3}{8}$ in that of the head. The posterior margin of the præoperculum is armed with a fine serrature, and with a distinct spine above the angle, which forms a produced, rounded, membranaceous lobe. The posterior extremity of the opercular apparatus is membranaceous, rounded, and formed by the operculum and suboperculum.

The origin of the first *dorsal* is in the vertical from the ninth scale of the lateral line, or from the middle of the interspace between the root of the pectoral and ventral fins. The first spine is minute; the second is the strongest, all the others being flexible; the third is the longest, $1\frac{1}{3}$ in the length of the head; the fourth is longer than the second, and the following rapidly decrease in length. A series of small scales ascends behind each spine nearly to the top. The distance between the two dorsals equals the length of the base of the second, which is entirely covered with scales, and has the upper edge emarginate; the first and second rays are the longest, rather higher than the spinous dorsal, and more than three times as long as the posterior rays. The distance between this fin and the caudal is $5\frac{1}{3}$ in the total length. The *caudal* fin is entirely covered with scales, deeply forked, with the lobes pointed, the upper of which is rather longer, and $3\frac{1}{2}$ in the total length. The distance between the caudal and *anal* fins is rather less than that between the caudal and dorsal, as the extremity of the anal falls behind that of the dorsal, and in the vertical from the 52nd scale of the lateral line. Its origin corresponds to that of the dorsal; it is entirely covered with scales, and has the lower edge emarginate; the first two spines are very small; the third is nearly one-half the length of the first ray; the first and second rays are the longest, and three times as long as the fourteenth. The length of the *pectoral* is one-sixth of the total; its basal half is covered with minute transparent scales. The free pectoral appendages are rather feeble, and the uppermost is the longest, reaching nearly to the tip of the pectoral. The root of the *ventral* falls behind the middle of the pectoral, in a vertical from the 12th scale of the lateral line; it is short, one-eighth of the total length, and reaches slightly beyond the vent; its spine is about one-half the length of the adjacent ray

The *scales* are rather small, scarcely higher than long, and have the posterior margin minutely ciliated. The lateral line is straight, and bifurcates at the root of the tail, each branch terminating at some distance from the median line of the caudal fin.

The *teeth* are minute and villiform; those of the vomer form a narrow transverse band; the band on the palatine bones is narrow, cuneiform.

The body is uniform silvery, with shining streaks along the longitudinal series of scales. The fins are more or less minutely dotted with black, the spinous dorsal and the pectoral fins becoming blackish towards their margin; the margins of the anal and ventral fins are white.

	inches.	lines.
Total length	7	7
Height of the body	1	10
Length of the head	1	7
Height of the tail (above the end of the anal)	1	0
Diameter of the eye	0	4½
Distance between the eyes	0	5
——— between the dorsal and caudal fins	1	5
Length of the maxillary	0	8
——— of the second dorsal spine	1	0
——— of the third dorsal spine	1	2½
——— of the second dorsal ray	1	4
——— of the twelfth dorsal ray	0	5
——— of the upper caudal lobe	2	2
——— of the second anal ray	1	3
——— of the pectoral	1	3
——— of the ventral	0	11
——— of a scale	0	1⅔
Height of a scale	0	2

9. Polynemus multiradiatus.

D. $8 \left| \frac{1}{15} \right.$. A. $\frac{2}{17}$. L. lat. 58.

Seven free pectoral appendages of moderate length. Præoperculum minutely serrated, without conspicuous spine above the angle. Snout short. The lateral line forked, from the root of the caudal. Caudal forked. The spinous dorsal blackish; the other vertical fins sparingly, the pectoral densely dotted with black.

Chinese Sea.

a. Stuffed. China. Purchased of Mr. Warwick.

The characters given above appear to be fully sufficient to distinguish this species from any other at present known; but I refrain from giving a full description, as the specimen is not in very good condition, some parts being deformed by stuffing. The longest pectoral appendage reaches nearly to the origin of the anal. The specimen is 8 inches long.

10. Polynemus hexanemus.

Cuv. & Val. iii. p. 389; ? *Bleeker, Perc.* p. 59; *Cantor, Catal.* p. 33.

D. 8 | $\frac{1}{12}$. A. $\frac{3}{11}$.

Six pectoral appendages, some of which reach to the caudal fin. The length of the caudal lobes is more than one-third of the total. (*Cuv. & Cant.*)

East Indian Seas.

a. Skin of a young specimen. Malayan Peninsula. From Dr. Cantor's Collection.

11. Polynemus xanthonemus.

Polynemus xanthonemus, *Cuv. & Val.* vii. p. 517; *Richards. Ichth. Chin.* p. 219.

? Polynemus approximans, *Lay & Benn. in Beech. Voy. Zool. Fishes,* p. 57.

D. 8 $\frac{1}{11}$. A. $\frac{3}{12}$. Cæc. pylor. 12.

Six pectoral appendages, reaching beyond the tip of the ventrals. The length of the caudal lobes is one-fifth of the total. Coloration uniform; fins edged with black. (*Val.*)

Coast of Coromandel.

Air-bladder none.

12. Polynemus sexfilis.

Cuv. & Val. vii. p. 515.

D. 8 | $\frac{1}{13}$. A. $\frac{3}{12}$.

Six pectoral appendages. The margins of the dorsal and anal fins emarginate. No black spot on the shoulder; tips of the dorsal and pectoral fins black. (*Val*)

Ile de France.

Air-bladder none; pyloric appendages in great number.

13. Polynemus kuru.

Bleeker, Ternate, ii. p. 600.

D. 8 | $\frac{1}{13}$. A. $\frac{3}{11}$. L. lat. 60.

Six pectoral appendages, the uppermost of which reaches to the vent. Præoperculum with a small spine above the angle. The second dorsal and the anal emarginate; the upper caudal lobe $3\frac{1}{3}$ in the total length. Yellowish, with about eighteen brown longitudinal stripes. (*Bl.*)

Sea of Ternate.

Air-bladder large.

14. Polynemus sextarius.

Bloch, Syst. p. 18. t. 4; *Cuv. & Val.* iii. p. 388. vii. p. 514; *Bleeker, Perc.* p. 59; *Cant. Catal.* p. 32.

D. $8 \left| \frac{1}{12-13} \right.$. A. $\frac{3}{12-13}$. [L. lat. 45? *Bleek.*]

Six pectoral appendages, reaching to, or slightly beyond the tip of the ventral; lobes of the caudal one-fifth of the total length. A black spot on the shoulder: pectorals sometimes black.

East Indian Seas.

Air-bladder excessively small, pointed at both extremities, of the shape and size of a grain of oats.

a. Young: skin: not good state. Malayan Peninsula. From Dr. Cantor's Collection.

15. Polynemus pfeifferæ.

Bleeker, Sumatra, ii. p. 249.

D. $8 \left| \frac{1}{11} \right.$. A. $\frac{3}{11}$. L. lat. 48.

Six pectoral appendages, some of which reach to the anal. The height of the body is $4\frac{1}{2}$ in the total length, the length of the head five times; the length of the upper maxillary is $1\frac{3}{4}$ in that of the head. Præoperculum with a small spine above the angle. The length of the caudal lobes is $3\frac{1}{4}$ in the total. Fins yellow, minutely dotted with black; the black colour predominant on the pectoral, ventral, anal and caudal fins. (*Bl.*)

Sea of Priaman (Sumatra).

Air-bladder large.

16. Polynemus indicus.

Russell, t. 184.

Polynemus indicus, *Shaw, Zool.* v. pt. i. p. 155; *Bleeker, Java*, p. 427; *Cant. Catal.* p. 29.

—— sele, *Buch. Ham. Gang. Fish.* pp. 226, 381: *M'Clell. Journ. As. Soc.* viii. 1839, p. 203 cum tab.; and *Calc. Journ. Nat. Hist.* ii. p. 450, iii. pp. 179, 181. pl. 6; *Cant. Proc. Zool. Soc.* vii. 1839, p. 115.

—— uronemus, *Cuv. & Val.* iii. p. 385; *Bleeker, Perc.* p. 58.

—— ploteus, plebejus, lineatus, et gelatinosus, *M'Clell. Calc. Journ. Nat. Hist.* ii. p. 450, iii. p. 179, &c.

D. $8 \left| \frac{1}{13-14} \right.$. A. $\frac{2}{11-12}$. L. lat. 65. L. transv. 7/13.

Five pectoral appendages, some of which reach beyond the tip of the ventral; caudal lobes sometimes produced into filaments; the third dorsal spine filamentous. The distance between the root of the ventrals and the anal longer than the head; a small prominent spine above the angle of the præoperculum.

East Indian Seas; coasts of Australia.

a. Thirty-five inches long: stuffed. India. Presented by the Zoological Society.

b. Twenty-seven inches long: stuffed.
c, d. Half-grown: bad state.
e. Adult. India. Presented by G. R. Waterhouse, Esq.
f, g. Half-grown: dried: bad state. Bay of Bengal. Presented by the Zoological Society.
h. Adult: stuffed. Calcutta. Purchased of Mr. Bartlett.
i. Adult: stuffed. Sea of Pinang.
k, l. Half-grown: skins. Sea of Pinang. From Dr. Cantor's Collection.
m. Half-grown: very bad state. Sydney. From the Haslar Collection.

Air-bladder with many appendages. Cæca pylorica in great number (cfr. *Cant. Catal.* p. 30).

17. Polynemus lineatus.

$D.\ 8 \mid \frac{1}{13}.\quad A.\ \frac{2}{11}.$ L. lat. 65. L. transv. 8/13.

Five pectoral appendages, one of which reaches beyond the tip of the ventral; lobes of the caudal not produced into filaments; the distance between the root of the ventral and anal fins much less than the length of the head. No distinct spine above the angle of the præoperculum. Back with eight distinct brown longitudinal lines, and about as many below the lateral line.

Seas of Amboyna and Guataleana.

a. Fine specimen. Amboyna. Purchased of Mr. Frank as *Polynemus kuru.*
b. Fine specimen. Guataleana. From the Museum of Economic Geology.

Description.—This species is moderately elongate, its greatest height, below the origin of the soft dorsal, being $4\frac{1}{5}$ in the total length. The tail is compressed and rather elevated, its height, below the end of the dorsal, being one-seventh of the total length. The length of the head is $4\frac{2}{3}$ in the total; its width between the eyes is $3\frac{1}{2}$ in its length. The snout is rather short and obtuse, half as long as the diameter of the eye, which is nearly one-fourth of the length of the head. The cleft of the mouth is wide, the upper maxillary reaching to the middle of the distance between the orbit and the posterior margin of the præoperculum, and its length being $2\frac{1}{5}$ in the length of the head. The posterior margin of the præoperculum descends obliquely backwards in a slight curve; it is serrated, the denticulations becoming coarser inferiorly; the angle forms a membranaceous lobe, rounded and produced.

The origin of the first *dorsal* is in the vertical from the eighth scale of the lateral line, or from the middle of the interspace between the root of the pectoral and ventral fins. The first spine is minute; the second is the strongest, all the others being flexible; the third is the longest, and $1\frac{1}{3}$ in the length of the head; the fourth is longer than the second, and the following rapidly decrease in length. A series of small scales ascends behind each spine. The distance between the two dorsals is shorter than the base of the second, which is entirely covered with scales and has the upper margin crescentic; the second and third rays are the longest, rather higher than the spinous dorsal, and three times as long as the posterior rays, except the last, which is, again, somewhat elongate. The distance between this fin and the caudal is one-fifth of the total length. The *caudal* fin is entirely covered with scales, deeply forked, with the lobes pointed, the upper of which is somewhat the longer, and $3\frac{1}{3}$ in the total length. The distance between the caudal and *anal* fins is rather less than that between the caudal and dorsal, as the extremity of the anal falls behind that of the dorsal, and in the vertical from the forty-sixth scale of the lateral line; its origin corresponds to the fourth dorsal ray. It is entirely covered with scales, and has the lower margin crescentic. Only two spines are visible, the second being less than one-half the length of the adjacent ray; the first and second rays are the longest, and more than twice as long as the tenth, the eleventh being, again, slightly elongate. The length of the *pectoral* is $6\frac{1}{2}$ in the total; its basal third is covered with minute scales. The uppermost of the pectoral appendages is the longest, reaching slightly beyond the tip of the ventral. The root of the *ventral* falls behind the middle of the pectoral, in a vertical from the eleventh scale of the lateral line; it is short, one-eighth of the total length, and reaches a little beyond the vent; its spine is about one-half the length of the adjacent ray.

The *scales* are rather small, about as high as long, and have the posterior margin minutely ciliated; their free portion is covered with minute spines, arranged in radiating series. The lateral line is straight to the root of the caudal, over which it extends in a downward, slightly oblique direction to a little beneath the notch.

The *teeth* are minute and villiform; those of the vomer form a narrow transverse band; the band on the palatine bones is cuneiform, broadest anteriorly.

The head and body are silvery, the latter with brown longitudinal lines, each running along the meeting of two series of scales; those above the lateral line are very distinct, those below less so, disappearing altogether on the belly. The fins are more or less dotted with black; the margins of the anal and ventral fins are white.

	inches.	lines.
Total length	8	1
Height of the body	1	11
——— of the tail beneath the end of the anal	1	2
Length of the head	1	9
Distance between the ventral and anal	1	3
——— between the caudal and dorsal	1	7
——— between the eyes	0	6
Diameter of the eye	0	$5\frac{1}{2}$
Length of the upper maxillary	0	$9\frac{1}{2}$

	inches.	lines.
Length of the third dorsal spine	1	4
——— of the second dorsal ray	1	5
——— of the upper caudal lobe	2	5
——— of the first anal ray	1	2
——— of the pectoral	1	3
——— of the ventral	1	0
——— of a scale	0	$2\frac{1}{2}$
Height of a scale	0	$2\frac{1}{3}$

18. **Polynemus plebejus.**

Polynemus plebejus, *Gm. L. Syst.* p. 1401; *Bloch*, t. 400; *Bl. Schn.* p. 17; *Shaw, Zool.* v. pl. 125; *Cuv. & Val.* iii. p. 380; (not *Fauna Japon.* pl. 11. f. 1;) ? *Bleeker, Perc.* p. 58; *Richards. Ann. & Mag. Nat. Hist.* 1842, ix. p. 210; *Cantor, Catal.* p. 27.
—— lineatus, *Lacép.* v. pl. 13. f. 2.
Bruce, Voyage, t. 41.
Polynemus niloticus, *Shaw, Zool.* v. p. 151.
Trigla asiatica, *Forst. Descript. Anim. cur. Lichtenst.* p. 236.

D. 8 | $\frac{1}{13\text{–}14}$. A. $\frac{2}{12\text{–}13}$. L. lat. 50. L. transv. 5/10.

Five pectoral appendages, some of which reach beyond the tip of the pectoral fin. In immature specimens a black blotch on the lateral line near its origin.

East Indian Seas; South Sea.

a. Half-grown. Amboyna. Purchased of Mr. Frank.
b. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.

Air-bladder simple; pyloric appendages exceedingly numerous.

19. **Polynemus tetradactylus.**

Russell, pl. 183; *Renard, Poiss.* f. 147.
Polynemus tetradactylus, *Shaw, Zool.* v. p. 155; *Cuv. & Val.* iii. p. 375, vii. p. 514; *M'Clell. Journ. As. Soc.* viii. 1839, p. 206; *Richards. Ichth. China*, p. 218; *Bleeker, Perc.* p. 57; *Cuv. Règne Anim. Ill. Poiss.* pl. 19. f. 1; *Cantor, Catal.* p. 25.
—— teria, *Buch. Ham.* pp. 224, 381; *Gray, Ind. Zool.* i. pl. 92. f. 2.
—— salliah et quadrifilis, *Cantor, Journ. As. Soc.* v. p. 166.

D. 8 | $\frac{1}{13\text{–}15}$. A. $\frac{2}{16\text{–}17}$. L. lat. 73–85.

Four pectoral appendages, not or scarcely reaching beyond the tip of the ventral fin.

East Indian Seas.

a. Adult. Borneo.
b. Adult. China. Presented by J. R. Reeves, Esq.
c, *d*. Half-grown. China.
e. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
f–k. Half-grown: skins. Malayan Peninsula. From Dr. Cantor's Collection.

l, m. Half-grown. Calcutta. From the Collection of Messrs. von Schlagintweit.
n. Adult. Ceylon. From Mr. Cuming's Collection.
o–q. Half-grown. India. Presented by G. R. Waterhouse, Esq.

Air-bladder none; pyloric appendages in immense number.

20. Polynemus quadrifilis.

Cuv. & Val. iii. p. 390, vii. p. 518. pl. 68.

D. $8 \mid \frac{1}{13}$. A. $\frac{2}{12}$. Cæc. pylor. 17.

Four pectoral appendages of moderate length. The vomerine teeth form a small and roundish group.

Western coast of Africa

Air-bladder very large.

21. Polynemus tridactylus.

Bleeker, Perc. p. 57 (not *Mitch.*).

D. 8 | 13. A. $\frac{3}{11}$. L. lat. 70.

Three pectoral appendages of moderate length.

Sea of Batavia.

2. PENTANEMUS.

Pentanemus, *Artedi in Sebæ Thesaur.* iii. p. 74.

Vertical fins partly naked. Two separate dorsals, the first with eight spines; all the spines feeble: the anal much longer than the soft dorsal In both jaws, on the palatine and pterygoid bones, bands of villiform teeth; none on the vomer. Scales moderate, ciliated. Præoperculum entire. Pyloric appendages in moderate number. Air-bladder present.

West coast of Africa; Caribbean Sea.

Strange as it may appear, this genus and species may be considered as a new discovery, although they represent the first *Polynemidæ* known. Artedi, Seba, Gronow, and Linné were acquainted with the fish: the first founded the genus *Pentanemus* (afterwards altered into *Polynemus*) on it, the second gave a very good figure, the third an excellent description, and Linné introduced it into the system with the other species then known; but all this was considered of little value by Cuvier, who doubted their accuracy, and thought the fish to be merely a deformed representation of *Polynemus paradiseus*. Bennett first again recognized the original fish of Artedi, whilst Pel, superficially, only consulted the literature and described the species as new. The centre of its habitat must be considered to be the African part of the Atlantic, although it appears to range as far as the West Indies, like many other fishes. All the naturalists above mentioned correctly state the Atlantic as its native sea.

1. Pentanemus quinquarius.

Pentanemus, *Artedi, l. c.* pl. 27. f. 2.
Polynemus, *Gronov. Mus. Ichthyol.* i. no. 74. p. 31.
—— quinquarius, *L. Syst. Nat.* i. p. 521; *Gronov. Syst. ed. Gray*, p. 176
—— artedii, *Benn. Proc. Zool. Soc.* i. p. 146.
—— macronemus, *Pel, Bydrage tot de dierk.* 1851, p. 9.

D. $8 \Big| \frac{1}{15}$. A. $\frac{2}{30}$. L. lat. 73. L. transv. 6/17. Cæc. pylor. 7?
Vert. 9/15.

Five free pectoral appendages, twice as long as the body.
West coast of Africa; Caribbean Sea.

a. Adult. River Niger. From Mr. Fraser's Collection.
b. Adult. Ashantee.
c. Adult. Africa.
d. Adult female: skeleton. Africa. Presented by the Zoological Society.
e. Adult. Africa. Presented by the Zoological Society.
f, g. Half-grown. Africa. From the Haslar Collection.
h, i. Half-grown. Africa
k. Half-grown. Africa.
l. Half-grown. Cuba. Presented by the Zoological Society.

I found the stomach filled with small entomostraca.

Skeleton.—The system of the muciferous channels of the bones of the skull is well developed, the channels themselves being very open, and closed by bony plates at a few parts only. The upper surface of the skull is provided with three longitudinal channels, a median one and one on each side, running from the turbinal bone, which is short, triangular, and hollow, above the orbit and the temporal region to the scapula; all the three channels show a series of large open foramina. The occipital crest and another lateral one are moderately elevated and very thin, whilst the entire outer crest is transformed into a part of the lateral channel. The cleft of the mouth being very wide, the jaw-bones are relatively much elongate: the maxillary is styliform in its basal third, and gradually widens in its other two thirds; the intermaxillary is as long as the maxillary, slender, styliform, with a very narrow band of minute teeth and with the posterior processes very short. The mandibula is feeble, toothed like the intermaxillary, and with a wide cleft between the dentary and articulary bones. The head of the vomer has anteriorly two prominent ridges, meeting at a rather obtuse angle, behind which is a deep groove; it is perfectly toothless, like the palatine bone, which is very short, one-fourth only of the length of the pterygoid. The præoperculum is narrow, semilunate, with a very distinct muciferous channel; the operculum triangular, with a slight ridge on its inner surface. The basal portion of the brain-capsule is slightly swollen on each side of the basisphenoid, showing a triangular impression between the two swellings. The glossohyal is small, styliform, the ceratohyal elongate. *The seven pectoral appendages are joined to the posterior margin of the radius*, which is rather wide, and fastened by a broad suture to a process of the humerus; the two processes of each of the humeral bones are firmly attached to each other. The two pubic bones do not leave a free space between them, and each is formed of three lamellæ, the interior of which is the broadest.

There are nine abdominal and fifteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 2. All the neural, hæmal, interneural and interhæmal spines are very feeble, except the first interneural of each of the dorsal fins, which is transformed into a rather broad bony plate.

3. GALEOIDES.

Polynemus, sp., *Bloch, Schneider, Cuv. & Val.*

Two separate dorsals, the first with eight spines; all the spines feeble: the soft dorsal and the anal nearly equal. In both jaws, and on the palatine bones, bands of villiform teeth; none on the vomer or pterygoids. Præoperculum serrated. Scales moderate. [Air-bladder simple, large.]

West coast of Africa.

1. Galeoides polydactylus.

Polynemus polydactylus, *Vahl in Skriv. Naturh. Selsk.* iv. p. 158; *Bl. Schn.* p. 19.
—— dekadactylus, *Bloch*, taf. 401; *Bl. Schn.* p. 19; *Cuv. & Val.* iii. p. 392.
—— enneadactylus, *Cuv. & Val.* iii. p. 392, vii. p. 518.

D. $8 \left| \frac{1}{14} \right.$. A. $\frac{2}{11}$. L. lat. 47–48. L. transv. 5/9. Vert. 10/14.

Nine or ten pectoral appendages of inconsiderable length.

Western coasts of Africa.

Air-bladder very large.

* *Specimens with nine appendages.*

a. Adult. Africa.
b. Adult: bad state. Africa. From the Haslar Collection.
c. Adult: skeleton. Africa. From the Haslar Collection.
d, e. Half-grown: very bad state. Africa. From the Haslar Collection.

** *Specimen with ten appendages.*

f. Adult. River Niger. From Mr. Fraser's Collection.

Skeleton.—The system of the muciferous channels of the bones of the skull is moderately developed, those on the upper surface of the skull being the widest. Each frontal bone has two tubes, slightly divergent, and radiating from the anterior extremity of the supraoccipital; there is an open groove in the middle. The crests are moderately elevated, the outer one forming merely a prominent ridge. The cleft of the mouth is not very wide, and therefore the jaw-bones are much less elongate than in *Pentanemus*: the maxillary is styliform, and widens very slightly at its posterior extremity; the intermaxillary is very feeble, with a slight posterior prominence and with stout processes, and, like the mandibula, it is furnished with a narrow villiform band of teeth; the mandibula has a cleft between the articulary and dentary bones. The vomer is perfectly toothless; its head has anteriorly two ridges, meeting at a rather obtuse angle, behind which is a shallow groove. The length of the palatine bone is about one-third of the pterygoid; its outer margin is armed with a narrow band of villiform teeth. The bottom of the orbit is nearly entirely bony. The præoperculum is rather narrow, nearly straight in a vertical direction, without a distinct inferior limb; its inner ridge is very low, not prominent, the muciferous channel rudimentary, and the free margin striated, the striæ terminating in a fine serrature. The operculum is triangular, with a slight ridge on its inner surface; the suboperculum is at least twice as large as the interoperculum, and very finely striated. The basal portion of the brain-capsule is neither swollen nor compressed, and the basisphenoid shows only some pores. The glossohyal is small, styliform; the ceratohyal moderately elongate. *The pectoral appendages are joined to the lower extremity of the radius*, which is not particularly wide; the openings between the radius and humerus are rather small. The two pubic bones do not leave a free space between them, and each is formed by three lamellæ, the upper of which is very narrow.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·6. All the neural, hæmal, interneural and interhæmal spines are feeble, except the first interneural of each of the dorsal fins, which is transformed into a bony plate, and the first interhæmal, which has a slight anterior ridge.

Fam. 14. SPHYRÆNIDÆ.

Percoidei, pt., *Cuv. Règne Anim.*; *Cuv. & Val. Hist. Nat. des Poiss.* iii. p. 325; *Müll. Berl. Abhandl.* 1844, p. 201.
Percidæ, pt., *Owen, Lect. on Compar. Anat.* p. 49.
Sphyrænoidei, *Agass. Recherches Poiss. Foss.* v. p. 93.
Sphyrænidæ, *Bleeker, Bydrage tot de kennis der Sphyrænoiden.*

Body elongate, subcylindrical, covered with small cycloid scales; lateral line continuous. Cleft of the mouth wide, armed with strong teeth. Eye lateral, of moderate size. Seven branchiostegals; pseudobranchiæ and air-bladder present. Two dorsal fins, remote from each other; anal similar to the second dorsal; *ventrals abdominal*, composed of one spine and five rays.

Carnivorous fishes, inhabiting the seas of the temperate and tropical regions. One genus only.

1. SPHYRÆNA *.

Sphyræna, *Artedi, Synon.* p. 112; *Cuv. Règne Anim.*; *Cuv. & Val.* iii. p. 325.

Body more or less elongate, covered with small smooth scales; cleft of the mouth wide. Large, trenchant teeth in both the jaws and on the palatine bones, none on the vomer. Two short dorsals, situated at a great distance from each other; the ventrals opposite the anterior dorsal, the short anal opposite the posterior. Branchiostegals seven; pseudobranchiæ present; air-bladder large, bifurcate anteriorly. Pyloric appendages in great number.

Inhabitants of nearly all the tropical and temperate seas.

1. **Sphyræna vulgaris.**

Σφύραινα, *Aristot.* ix. cap. 2; *Ælian*, i. cap. 33; *Athen.* vii.; *Oppian*, lib. i. ii. & iii.
Sudis, *Plin.* xxxii. cap. 11; *Salvian.* p. 69.
Sphyræna, *Rondel.* viii. cap. 1; *Gesner*, p. 882; *Willughby*, p. 273; *Artedi, Synon.* p. 112.
Sphyræna s. Sudis, *Salvian.* p. 70; *Aldrov.* i. cap. 21. p. 102; *Jonston*, lib. i. tit. 2. cap. 1. art. 16. tab. 18. f. 1; *Ray*, p. 84.
Esox sphyræna, *L. Gm.* p. 1389.
Sphyræna sphyræna, *Bl.* taf. 389; *Bl. Schn.* p. 109; *Risso, Ichth. Nice*, p. 332; *Martens, Reise nach Venedig*, ii. p. 426.
—— spet, *Lacép.* v. pp. 326, 328; *Bonap. Faun. Ital. Pesci*, cum fig. (juv.).
—— becuna, *Lacép.* v. pp. 327, 329. pl. 9. f. 3; *Cuv. & Val.* iii. p. 340, vii. p. 507 (part.).

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* 1. Sphyræna chinensis, *Richards. Ichth. Chin.* p. 266.—Chinese Sea
2. —— affinis, *Rüpp. Neue Wirbelth. Fische*, p. 98.—Red Sea.

Esox becuna, *Shaw, Zool.* v. p. 112.
Sphyræna vulgaris, *Cuv. & Val.* iii. p. 327; *Cuv. Règne Anim. Ill. Poiss.* pl. 18. fig. 1.
—— viridensis, *Cuv. & Val.* iii. p. 339.
—— guachancho, *Cuv. & Val.* iii. p. 342.
—— borealis, *Dekay, New York Fauna, Fishes*, p. 39. pl. 60. f. 196.

D. $5 \mid \frac{1}{9}$. A. $\frac{1}{9}$. L. lat. 150. L. transv. 25–30. Vert. 24.

The height of the body is nine or ten times in the total length, the length of the head $3\frac{1}{2}$; the diameter of the eye is one-eighth of the length of the head. Operculum with a single point, lower jaw with a long fleshy appendage anteriorly. The length of the pectoral is one-twelfth of the total, and nearly equal to that of the ventrals; the spine of the latter is not much shorter than the rays. The origin of the first dorsal is far behind the extremity of the pectorals, and somewhat before the vertical from the root of the ventrals, in the middle of the length of the fish, the caudal not included. The interspace between the two dorsals is equal to one-sixth of the total length. Above uniform greenish lead-coloured, beneath silvery; the colour of the back sometimes emits cross-bars intersecting the lateral line. Young individuals brown-spotted.

Mediterranean; Atlantic.

a. Large specimen. Europe. Presented by the Zoological Society.
b. Large specimen. Europe.
c, d. Adult. Europe. From the Haslar Collection.
e. Adult. Europe. From the Haslar Collection.
f. Adult. Lanzarote. Presented by the Rev. R. T. Lowe.—=*Sphyræna viridensis.*
g. Half-grown. New York. Purchased of Mr. Brandt.

2. Sphyræna novæ Hollandiæ.

D. $5 \mid \frac{1}{9}$. A. $\frac{1}{10}$. L. lat. 135.

The height of the body is nearly one-eleventh of the total length, the length of the head one-fourth; the diameter of the eye is one-seventh of the latter. Operculum rounded posteriorly. The length of the pectoral is one-twelfth of the total and more than that of the ventral; the spine of the latter is not much shorter than the rays. The origin of the first dorsal is behind the vertical from the root of the ventral, before the middle of the length of the fish, the caudal not included. The interspace between the two dorsals is equal to one-fourth of the total length. Colour above greenish, beneath silvery.

Coast of New Holland.

a. Skin. Hobson's Bay, Port Phillip. From Mr. Macgillivray's Collection.

This species is very slender, the greatest height in the middle of its body being one-eleventh of the total length. The snout is very produced, one-half the length of the head; the maxillary terminates at a considerable distance from the eye. There are two pairs of fangs in the upper jaw, the posterior being the strongest; the anterior part of the palatines is armed with five strong teeth; the teeth in the mandibula are widely set, very feeble anteriorly, and becoming gradually stronger in the middle of the jaw. The limbs of the præoperculum meet at an obtuse angle. The pectoral is rather short, one-twelfth of the total length, and not extending on to the ventral. The first dorsal commences behind the vertical from the root of the ventral; the second is nearer to the caudal than to the spinous dorsal; the anal is opposite to the second dorsal.

	inches.	lines.
Total length	16	0
Height of the body....................	1	6
Length of the head	4	0
Diameter of the eye	0	7
Length of the pectoral	1	4
Distance between the two dorsals........	4	0

3. Sphyræna picuda.

Picuda, *Parra,* p. 90. lam. 35. f. 2.
Bécune, *Rochefort, Hist. des Ant.* p. 181. f. 5.
Parricoota, *Dampier, Voy. Campeachy Bay,* p. 71.
Barracuda, *Sloane, Hist. Nat. Jamaic.* ii. p. 185. pl. 347. f. 3; *Catesby,* ii. pl. 1. f. 1.
Sphyræna picuda, *Bl. Schn.* p. 110. t. 29. f. 1.
Esox barracuda, *Shaw, Zool.* v. p. 105.
Sphyræna barracuda, *Cuv. & Val.* iii. p. 343. pl. 66; *Owen, Catal.* p. 53; *Agass. Rech. Poiss. Foss.* v. pl. F. p. 94.

D. $5 \mid \frac{1}{9}$. A. $\frac{1}{9}$. L. lat. 83. L. transv. 9/15. Vert. 12/12.

The height of the body is contained more than seven times in the total length, the length of the head $3\frac{1}{2}$; the diameter of the eye is one-eighth of the length of the head. Lower jaw with a fleshy appendage of moderate length, and with sixteen to twenty teeth. The length of the pectoral fins is one-eleventh of the total; the first dorsal and the ventral fins commence on the level of the point of the pectorals, far before the middle of the body; the interspace between the two dorsals is equal to one-fifth of the total length. Above uniform greenish lead-coloured, beneath silvery; sometimes with several large brownish-black blotches on the side.

Tropical parts of the Atlantic.

a. Adult. S. Domingo. From Mr. Cuming's Collection.
b. Young. S. Domingo. From Mr. Cuming's Collection.
c. Adult. Puerto Cabello. Purchased of Mr. Brandt.
d. Very large specimen: skin. From Dr. Parnell's Collection.
e–g. Adult, half-grown, and young: skins. Jamaica. From Dr. Parnell's Collection.
h. Young: bad state. W. Indies. Purchased of Mr. Scrivener.
i. Adult. River Niger. From Mr. Fraser's Collection.

4. Sphyræna jello.

Jellow, *Russell*, pl. 174.
Sphyræna jello, *Cuv. & Val.* vi. p. 349; *Bélanger, Voy. Zool.* p. 346. pl. 1. f. 1 (not good); *Rüppell, N. Wirb. Fische*, p. 98; *Bleeker, Perc.* p. 56; *Cantor, Catal.* p. 24; *Bleeker, Batjan*, p. 369, and *Sphyræn.* p. 12.

D. $5 \mid \frac{1}{9}$. A. $\frac{1}{9}$ L. lat. 125. L. transv. 35. Vert. 12/12.

The height of the body is contained nine times in the total length, the length of the head $3\frac{1}{2}$–4; the diameter of the eye is one-fifth of the latter. Operculum with two points. Lower jaw with a fleshy appendage in front, of moderate length. The first dorsal fin and the ventrals commence on the level of the extremity of the pectorals. Above greenish lead-coloured, forming on the upper part of the sides a festooned band, with eight bars intersecting the lateral line; beneath silvery; fins yellowish.

Red Sea; Cape of Good Hope; Bay of Bengal; Seas of Pinang, Java, and Amboyna.

a. Young. Amboyna. From Mr. Frank's Collection.
b. Young: bad state. China. Presented by Captain Sir E. Belcher, C.B.
c. Adult: stuffed. China. Presented by J. R. Reeves. Esq.
d. Half-grown: stuffed. Presented by the East India Company.
e. Adult: stuffed. Cape Seas. From Sir A. Smith's Collection.
f, g. Adult: stuffed. Calcutta. From the Collection of the East India Company.
h. Young: skin. Malayan Peninsula. From Dr. Cantor's Collection.
i. Adult: stuffed.

5. Sphyræna forsteri.

Cuv. & Val. iii. p. 353, vii. p. 509; *Bleeker, Java*, ii. p. 424, and *Sphyræn.* p. 13.

D. $5 \mid \frac{1}{9}$. A. $\frac{1}{9}$. L. lat. 110. L. transv. 30.

The height of the body is one-ninth of the total length, the length of the head nearly one-fourth; the diameter of the eye is $4\frac{1}{2}$ or five times in the latter. The upper maxillary bone reaches to the anterior edge of the orbit. Operculum with a single flexible point. Lower jaw with a conical tubercle in front, and with about 19 stronger posterior teeth. The length of the pectoral fins is about one-eleventh of the total, and more than that of the ventrals. The root of the ventral fins falls below the posterior half of the pectorals. The first dorsal fin commences just above the extremity of the pectoral, but behind the root of the ventral. Above uniform greenish, beneath silvery; the dorsal and caudal fins violet, the others yellowish.

Seas of Batavia, Calcutta, New Guinea, and Otaheite.

a. Adult: stuffed. Calcutta. Presented by E. Blyth, Esq.

6. Sphyræna japonica.

Cuv. & Val. iii. p. 354; *Faun. Japon.* p. 33; *Bleeker, Nieuwe Nalez. Ichthyol. Japan,* p. 67. taf. 3. f. 2.

D. 5 | $\frac{1}{8-9}$. A. 9–10. L. lat. 110.

The height of the body is $8\frac{1}{2}$–9 in the total length, the length of the head $3\frac{3}{5}$–$3\frac{3}{4}$; the diameter of the eye is $5\frac{1}{3}$–$5\frac{2}{3}$ in the latter. The upper maxillary reaches to, or nearly to the anterior margin of the eye. Præoperculum with a rounded angle. The origin of the first dorsal and of the ventrals falls behind the extremity of the pectorals. Above bluish-green, beneath silvery; fins yellowish, transparent; caudal darker-edged behind.

Sea of Japan.

7. Sphyræna argentea.

Girard, Proc. Acad. Nat. Sc. Philad. 1854, p. 144, and *U. S. Pacif. R. R. Exped. Fishes,* p. 39. pl. 14.

D. 5 | $\frac{1}{11}$. A. 10.

The length of the head is a little more than the fourth part of the total. The upper maxillary bone is far from reaching the level of the eye; opercles scaly. The first dorsal commences at some distance behind the extremity of the pectoral, and somewhat before the vertical from the root of the ventral. Above bluish-black, beneath silvery; lateral line black; fins yellowish. (*Girard.*)

San Diego (California).

8. Sphyræna commersonii.

Renard, Poiss. i t. 40. f. 202; *Valentyn, Ind.* iii. p. 369. f. 70.

Sphyræna commersonii, *Cuv. & Val.* iii. p. 352; *Bleeker, Perc.* p. 55, *Java,* p. 425, and *Sphyræn.* p. 15.

D. 5 | $\frac{1}{9}$. A. $\frac{1}{9}$. L. lat. 80–90.

The height of the body is $8\frac{2}{3}$–$9\frac{1}{4}$ in the total length, the length of the head $3\frac{2}{3}$–4; the diameter of the eye is about one-fifth of the length of the head: the posterior end of the maxillary bone reaches to the anterior edge of the orbit. Operculum with a single flexible point. Lower jaw with a conical tubercle in front, and about 15 to 18 longer posterior teeth. The length of the pectoral fins is one-tenth or one-eleventh of the total, and more than that of the ventrals. The first dorsal fin commences just above the point of the pectorals, but behind the insertion of the ventrals. Above uniform bluish-green, beneath silvery; dorsal, caudal and anal fins violet.

Javanese Sea; Molucca Sea. Hindostan.

9. Sphyræna nigripinnis.

Schleg. Faun. Japon. p. 34. pl. 13. f. 1.

D. 5 | $\frac{1}{9}$. A. $\frac{1}{9}$.

The height of the body is contained eight times in the total length, the length of the head $4\frac{1}{2}$. Eye small; its diameter forms about one-ninth of the length of the head. Operculum with a single feeble point; præoperculum rounded. Lower jaw with an obtuse conical prominence in front. The length of the pectoral fins is only one-eleventh of the total, and rather more than that of the ventrals. The first dorsal commences just above the point of the pectoral, but a little behind the root of the ventrals. The interspace between the two dorsals is equal to one-fourth of the total length. Above bluish-green, beneath silvery; all the fins black. (*Schleg.*)

Japanese Sea.

a. Young: stuffed: bad state.

10. Sphyræna dussumieri.

Cuv. & Val. vii. p. 508.

D. $5 \mid \frac{1}{9}$. A. $\frac{1}{9}$. L. lat. 95. L. transv. 10/16.

The height of the body is contained $7\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{2}$. Operculum with two points; præoperculum rounded. Lower jaw with a short fleshy appendage, and with about 22 teeth on each side. The first dorsal and the ventral fins commence on the level of the extremity of the pectorals, far before the middle of the body. The interspace between the two dorsals is $4\frac{3}{4}$ in the total length. Above blackish-blue, beneath silvery; dorsal, anal and caudal fins black, with white tips.

Indian Ocean; Ile de France.

a. Large specimen: stuffed. Indian Ocean. Presented by T. C. Jerdon, Esq.

11. Sphyræna obtusata.

Renard, Poiss. i. 40, 202; *Valentyn, Ind.* iii. p. 369. no. 70.
? Sphyræna chinensis, *Lacép.* v. p. 321. t. 10. f. 2.
Sphyræna obtusata, *Cuv. & Val.* vi. p. 350; *Bleeker, Perc.* p. 56, *Sphyræn.* p. 17, and *Batjan*, p. 364; *Cant. Catal.* p. 24; *Faun. Japon.* p. 33. pl. 13. f. 2 (bad).

D. $5 \mid \frac{1}{9}$. A. $\frac{1}{9}$. L. lat. 90.

The height of the body is contained seven or eight times in the total length, the length of the head $3\frac{1}{3}$; the diameter of the eye is more than one-fifth of the length of the head. Opercles scaly. Lower jaw without or with a very slight fleshy appendage in front. The first dorsal and the ventral fins commence in the vertical from the extremity of the pectorals. Præoperculum not rounded, with the angle slightly produced. Above uniform greenish lead-coloured, beneath silvery; fins yellowish.

Red Sea; Ile de France; Bay of Bengal; Indian Ocean; Molucca Sea; Port Jackson.

a, b. Adult. Australia. Presented by J. Macgillivray, Esq.
c. Adult: skin. Port Jackson, New South Wales.

d. Adult. Amboyna.
e. Half-grown. Amboyna. From the Collection of Madame Ida Pfeiffer.
f. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.
g. Young: bad state. India. From the Haslar Collection.

12. Sphyræna langsar.

Bleeker, Batjan, i. p. 367, and *Sphyræn.* p. 19.

D. $5 \mid \frac{1}{9-10}$. A. 10–11. L. lat. 80.

The height of the body is contained nine times in the total length, the length of the head $3\frac{2}{3}$–$3\frac{3}{4}$; the diameter of the eye is one-fifth of the latter; the snout is nearly twice as long as the eye. Operculum without spine; præoperculum obliquely emarginate, with an acute membranaceous angle. The upper maxillary bone does not reach to the level of the eye; lower jaw with a conical point, but without appendage. The first dorsal fin commences just above the extremity of the pectoral, but behind the root of the ventrals. The distance between the first and second dorsals is twice the length of the latter. Above uniform greenish, beneath silvery; fins scarcely coloured. (*Bl.*)

Sea of Batavia and Batjan.

13. Sphyræna brachygnathus.

Bleeker, Batjan, p. 368, and *Sphyræn.* p. 21.

D. $5 \mid \frac{1}{8-9}$. A. 10–11. L. lat. 85.

The height of the body is $9\frac{1}{2}$ or 10 in the total length, the length of the head $3\frac{2}{3}$–$3\frac{3}{4}$; the diameter of the eye is $4\frac{1}{2}$ in the latter; the snout is more than twice the diameter of the eye. Operculum without spine; præoperculum obliquely emarginate, with an acute membranaceous angle. The upper maxillary bone does not reach to the level of the eye; lower jaw with a conical point, but without appendage. The first dorsal fin commences behind the extremity of the pectoral; the distance between the first and second dorsals is more than twice the length of the latter. Above greenish, beneath silvery; fins yellowish, caudal edged with darker. (*Bl.*)

Sea of Batavia and Batjan.

14. Sphyræna flavicauda.

Rüppell, N. W. Fische, p. 100. taf. 25. f. 3.

D. $5 \mid \frac{1}{9}$. A. 11. L. transv. 18–20.

The height of the body is contained eight times in the total length, the length of the head $3\frac{1}{4}$; the diameter of the eye is one-fifth of the latter. Opercles scaleless; præoperculum rectangular. Lower jaw with a short conical prominence in front. The first dorsal fin commences just above the extremity of the pectoral, but behind the root of the ventrals. The interspace between the two dorsals is nearly one-sixth of the total length. Above greenish, beneath silvery; lateral line brown, a brownish-yellow longitudinal streak beneath; fins scarcely coloured. (*Rüpp.*)

Red Sea.

15. Sphyræna agam.

Esox sphyræna, *Forsk.* p. 16.
Sphyræna agam, *Rüppell, N. W. Fische*, p. 99. taf. 25. f. 2.

$$D.\ 5 \left| \frac{1}{9} \right. .\quad A.\ 9.\quad L.\ transv.\ 22.$$

The height of the body is contained eight times in the total length, the length of the head $3\frac{3}{4}$. Eye rather small. Præoperculum rounded. The first dorsal commences just above the extremity of the pectoral fin, but behind the root of the ventral. Caudalis with three notches. Above dark greenish, beneath silvery; all the vertical fins blackish, with whitish tips. (*Rüpp.*)

Red Sea.

Fam. 15. TRICHIURIDÆ.

Scomberoidei, pt., *Cuv.*, *Müll.*, *Owen.*

Body elongate and compressed, naked or with minute scales; eye lateral; cleft of the mouth wide, with several strong teeth in the jaws or on the palate. The spinous and the soft portions of the dorsal and the anal elongate and many-rayed; tail sometimes with finlets; ventrals thoracic, sometimes rudimentary or entirely absent. No prominent papilla near the vent. Gill-opening wide; seven (eight) branchiostegals; pseudobranchiæ; an air-bladder; pyloric appendages in increased number. The abdominal and caudal portions of the vertebral column composed of numerous vertebræ.

Inhabitants of the seas between the tropics, extending on to those of the temperate regions.

The structure of the head and of the dentition in these fishes much resembles that of the *Sphyrænidæ*, whilst they approach the *Blenniidæ* in the structure of the vertical fins.

Synopsis of the Genera.

Ventrals none; a dagger-shaped spine behind the vent	1. Aphanopus.
Ventrals none or rudimentary; caudal distinct; a single dorsal	2. Lepidopus.
Tail tapering, without distinct caudal	3. Trichiurus.
Ventrals well developed; finlets none	4. Epinnula.
Ventrals reduced to a single spine; finlets none	5. Dicrotus.
Two to six finlets; palatine teeth	6. Thyrsites.
Six finlets; no teeth on the palate	7. Gempylus.

1. APHANOPUS.

Aphanopus, *Lowe, Proc. Zool. Soc.* 1839, p. 79.

Body very elongate, band-like; cleft of the mouth very wide. Two very long dorsals along all the back; caudal well developed; no trace of ventrals; anal spines numerous, very feeble; a strong dagger-shaped spine behind the vent. Scales none. Strong teeth in the jaws, none on the palate. Extremity of the tail strongly depressed. Seven branchiostegals. Air-bladder present. Pyloric appendages in moderate number.

Sea of Madeira.

1. Aphanopus carbo.

Lowe, l. c.

D. 37–39 | 54. A. 45. Cæc. pylor. 6. Vert. 43/57.

Uniform black.

Sea of Madeira.

a. Thirty-nine inches long. Madeira. Presented by the Rev. R. T. Lowe.

b. Skeleton of a large male specimen. Madeira. Presented by the Rev. R. T. Lowe.

The structure of the air-bladder cannot clearly be made out, owing to the state of the internal parts. The membranes are very thick, though soft, and the red glandular masses in the interior are well developed. It emits a narrow conical process, anteriorly and posteriorly. The testicles are separate from each other. The peritoneum, entirely black, is full of a Nematoid.

Skeleton.—The structure of the skull greatly resembles that of *Sphyræna*, but the bones are still more elongate, especially those forming the portion before the orbit. The upper surface of the skull is flat, with several longitudinal grooves and ridges; the width of the interorbital space is rather less than the vertical diameter of the orbit. The crown of the head is provided with a very feeble occipital ridge, and with three others on each side, of moderate height. The basal portion of the brain-capsule is neither rounded nor compressed; and the anterior part of the basisphenoid is very narrow, styliform. The principal frontals diverge anteriorly to receive the ethmoid, which is very narrow and elongate, and forms a part of the upper surface of the skull. The præfrontals are distinctly separated from the principal frontal bones, and form the anterior portion of the orbit. The vomer is hammer-like, and entirely destitute of teeth; the palatine bones are very long, straight, situated vertically. The maxillary is well developed, and terminates in a broader portion, to which the intermaxillary is joined. The latter projects considerably beyond the snout, and is armed with a series of very strong, flat, lancet-shaped teeth, which are inserted between the exterior and interior lamellæ of the bone: there is a long tooth at its foremost extremity; then follow a pair of still longer ones; ten teeth, half the size of the longest, occupy the remainder of the bone; they are widely set; and there is an immature tooth in every one of the interspaces, destined to replace, at a future period, those which are in function. The teeth of the mandibula are similar, fourteen in number, but there are no longer fangs. The mandibula is long and solid, with the free space between the dentary and articular bones very narrow, and with a rudimentary muciferous channel at the lower side.

The turbinal bone is short. There is only one infraorbital bone—the præorbital; it is suspended on the præfrontal, and has a flat process in the middle of its length, which is directed forwards, and covers only a small portion of the snout. The præoperculum is subcrescentic, with a low ridge along its posterior limb, an widens into a flat lamella behind the ridge. The operculum is comparatively small, and tapers posteriorly to a very thin, fringed flap; the margin of the suboperculum is also fringed; the interoperculum oblong.

The glossohyal and the other bones of the branchial apparatus are very elongate, the branchiostegals feeble and very slender.

The humeral arch is very simple, and the bones by which it is formed are narrow and slender. The humeral is styliform, rib-like; the carpal bones are very small.

There are forty-three abdominal and fifty-seven caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·06. The vertebræ are of moderate length; the fourteenth vertebra to the thirty-first have a small curved process at both extremities, in the median line of the abdominal side. The ribs are very feeble, without pleurapophyses. An interneural and interhæmal spine correspond to each neural and hæmal; all are slender and of moderate height.

2. LEPIDOPUS.

Lepidopus, *Gouan, Hist. Poiss.* p. 185; *Cuv. & Val.* viii. p. 218.

Body very elongate, band-like; cleft of the mouth wide. One single dorsal along the whole back; caudal well developed. Ventrals reduced to a pair of scales; anal spines numerous, but minute, or hidden beneath the skin. Scales none. Several strong teeth in the jaws; teeth on the palatine bones. No keel on the tail. Eight branchiostegals. Air-bladder present. Pyloric appendages in increased number.

Mediterranean. Eastern parts of the Atlantic.

1. Lepidopus caudatus.

The Scabbard-fish.
? Serpent marin, *Leguat, Voyage,* ii. p. 40.
Lepidopus, *Gouan, l. c.* pl. 1. f. 4; *Bowdich, Exc.* p. 10. f. 1.
Trichiurus caudatus, *Euphrasen, Stockh. K. Vet. Acad. Nya Handl.* 1788, ix. p. 52. tab. 9. f. 2.
Lepidopus gouani, *Bl. Schn.* p. 239. tab. 53. f. 2 (very bad); *Risso, Ichth. Nice,* p. 151, and *Eur. Mérid.* iii. p. 290.
Trichiurus gladius, *Holten, Kjöbenh. Skrivt. Af. Nat. Selsk.* v. p. 23. tab. 2. f. 1.
—— ensiformis, *Vandelli.*
Vandellius lusitanicus, *Shaw, Zool.* iv. p. 199.
Lepidopus lusitanicus, *Leach, Zool. Misc.* ii. p. 7. pl. 62.
Ziphotheca tetradens, *Montagu, Wern. Mem.* i. p. 82. tab. 2 & 3, ii. p. 432.
Lepidopus peronii, *Risso, Ichth. Nice,* p. 148. pl. 5. f. 18.
—— argenteus, *Nardo, Giorn. di Fis. Pav.* vii. p. 227.
—— argyreus, *Cuv. Règne Anim.*; *Cuv. & Val.* viii. p. 223. pl. 223; *Yarrell, Brit. Fishes,* i. p. 198; *Lowe, Trans. Zool. Soc.* ii. p. 181; *Guichen. Explor. Algér. Poiss.* p. 59.

Lepidopus caudatus, *White, Catal. Brit. Fishes*, p. 32.
Skeleton: *Agass. Recherch. Poiss. Foss.* v. pl. D.

D. 102–104. A. 24–25. Cæc. pylor. 23. Vert. 41/71.

The height of the body is 15½ in the total length; the caudal deeply forked. Anal spines in great number—minute, if visible. Uniform silvery.

Mediterranean. Eastern shores of the Atlantic, from the Cape of Good Hope to the south coast of England.

a. Fifty inches long: stuffed. English coast.
b. Young. English coast. From Montagu's Collection.
c. Adult. South Europe. Presented by R. B. Webb, Esq.
d. Adult. Atlantic.
e. Fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.
f. Adult: stuffed. Cape Seas. From Sir A. Smith's Collection.
g. Sixty-four inches long: stuffed.
h. Fifty-six inches long: stuffed.
i. Five feet long: skeleton.
k. Young. From the Collection of the Zoological Society.
l, m. Young. From the Haslar Collection.

Skeleton.—The skeleton of this species is very similar to that of *Aphanopus*, from which it differs in the following points:—

Two ridges running along the interorbital space converge posteriorly and form an acute prominence at their meeting angle, where, externally, the elevation of the neck is visible; they are not continued into an occipital crest.

There are two crests on each side of the occiput, converging anteriorly and forming a single crest.

The head of the vomer forms a semicircular plate, slightly excavated and entirely smooth. The margin of the palatine bone is provided with a series of minute teeth.

The middle part of the maxillary is much broader than its extremity, whilst in *Aphanopus* the latter is the broader. The two long teeth at the foremost extremity of the intermaxillary, which we have described in *Aphanopus*, are absent in this species, whilst the two other pairs, situated further backwards, are the same; the remainder of the jaw is occupied by a series of about twenty much smaller teeth. The mandibula has a fang in front, and about twenty smaller ones on the side.

The præoperculum is quite smooth, without ridge; the operculum is quadrangular, and has, like the suboperculum, the posterior margin fringed.

The epicoracoid is long and rib-like; the ulna is distinguished by its considerable width and by a rounded inferior margin. The pubic bones are reduced to a styliform bone.

There are forty-one abdominal and seventy-one* caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·3. Several of the interneural spines are swollen to a globular bony mass, and are probably diseased. None of the vertebræ have the processes on the abdominal surface observed in *Aphanopus*.

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* Cuvier says, p. 229, " Il a cent onze vertèbres, dont quarante-une abdominales et soixante caudales."

3. TRICHIURUS.

Trichiurus, *L. Syst. Nat.* i. p. 429; *Cuv. Règne Anim.*; *Cuv. & Val.* viii. p. 235.

Body very elongate, band-like; tail tapering to a point; cleft of the mouth wide. One single dorsal along the whole back; caudal none; ventrals reduced to a pair of scales, or entirely absent; anal spines numerous, but minute, or hidden beneath the skin. Scales none. Strong teeth in the jaws; teeth on the palatine bones, none on the vomer. Seven branchiostegals. Air-bladder present. Pyloric appendages in increased number.

Seas between the tropics, extending on to the temperate regions.

1. Trichiurus lepturus.

The Hair-tail.
Seba, 33. 1.
Lepturus, *Artedi, Spec.* p. 111; *L. Mus. Ad. Fried.* i. p. 76. pl. 26. f. 2.
Trichiurus lepturus, *L. Syst. Nat.* i. p. 429; *Hoy, Linn. Trans.* xi. p. 210; ? *Bl.* t. 158; *Bl. Schn.* p. 517; *Cuv. & Val.* viii. p. 237; *Yarrell, British Fishes,* i. p. 204; *Storer, Bost. Journ.* iv. p. 181; *Casteln. Anim. nouv. ou rares Amér. Sud,* p. 24; *Dekay, New York Fauna, Fishes,* p. 109. pl. 12. f. 35; *Guichen. Poiss. in Ramon de la Sagra, Hist. Cuba,* p. 105.
Gymnogaster, *L. Syst. Nat.* ed. 7. p. 53; *Gronov. Mus. Ichth.* i. p. 17; *Brown, Jamaica,* p. 444. tab. 45. f. 4.
Enchelyopus, *Klein, Miss.* iv. p. 52. pl. 12. f. 7.
Trichiurus argenteus, *Shaw, Zool.* iv. p. 90. pl. 12; *Mitch. Trans. Lit. & Phil. Soc. New York,* i. p. 364.

D. 135. Cæc. pylor. 24. Vert. 39/120.

The diameter of the eye is one-third of the length of the snout, and equals the interorbital space, which is flat. The lateral line descends behind the pectoral towards the belly in a strongly oblique direction. No trace of ventral fins. Silvery.

Atlantic.

a. Fine specimen. South America.
b–d. Half-grown. S. Domingo. Purchased of Mr. Cuming.
e. Adult: bad state. Bahia. Purchased of M. Parzudaki.
f. Adult: skin. Jamaica. From Dr. Parnell's Collection.
g–k. Adult and half-grown: skins.
l, m. Half-grown. Old Collection.
n. Adult male: skeleton.
o. Intestines of specimen *n*.

Skeleton.—Cuvier mentions, as a remarkable peculiarity of the skull of this species, that the occipital and parietal bones are consolidated into a large, thick mass as hard as stone. This is not the case in the skeleton which serves for the present description; but I imagine that the skull of Cuvier's specimen shows a similar disease of the bones to that we have observed in several of the neural and interneural spines of *Lepidopus caudatus*. The structure of the skull is extremely similar to that in *Aphanopus* and *Lepidopus*, but differs from the latter in the following points:—

The two ridges on the interorbital space, which converge posteriorly and form an acute prominence in the middle of the crown of the head, begin above the anterior part of the orbit, and meet at an angle of about 30°.

The palatines are provided with a narrow band of villiform teeth. The intermaxillary bones are armed with two pairs of strong fangs, the anterior of which is situated at the foremost extremity of the bones; the lateral series are formed by about fifteen teeth in each of the jaws.

The præorbital is membranaceous, striated, covering nearly the whole space between the orbit and the jaw-bones. The operculum and suboperculum have the posterior margin provided with long flexible fringes.

The abdominal portion of the vertebral column is formed by thirty-nine, the caudal by about one hundred and twenty vertebræ*. The posterior vertebræ can scarcely be distinguished from one another. The ribs are excessively frail, filiform; the hæmal and neural spines are slender, and an interhæmal and interneural correspond to every one of them.

2. **Trichiurus savala.**

Trichiurus savala, *Cuv. Règne Anim.*; *Cuv. & Val.* viii. p. 251. pl. 224; *Cant. Ann. & Mag. Nat. Hist.* ix. p. 15, and *Catal.* p. 115; *Cuv. Règne Anim. Ill. Poiss.* pl. 68; *Bleek. Makr. Verh. Bat. Gen.* xxiv. p. 41

—— armatus, *Gray, Zool. Misc.* p. 9, and *Ill. Ind. Zoól.* pl. f. 1; *Richards. Ichth. China*, p. 268.

D. 112–130.

The height of the body is 13 to 16 times in the total length, the length of the head 6½ to 7¼; the diameter of the eye is 3½ in the length of the snout, and equals the width of the interorbital space, which is quite flat.

East Indian Seas.

a. Adult. India. Presented by General Hardwicke.—Type of *Trichiurus armatus*.

Adult. China.

c. Adult: skin. Malayan Peninsula. From Dr. Cantor's Collection.

d. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.

3. **Trichiurus japonicus.**

Trichiurus lepturus japonicus, *Faun. Japon. Poiss.* p. 102. pl. 54.

—— japonicus, *Bleek. Verhand. Batav. Genootsch.* xxvi. *Japan*, p. 98.

D. 139.

The height of the body is 16 times in the total length, the length of the head $8\frac{4}{5}$; the diameter of the eye is $2\frac{1}{3}$ in the length of the snout. Silvery.

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* Cuvier states sixty vertebræ for the abdominal portion, and one hundred for the caudal.

Sea of Japan.

4. **Trichiurus muticus.**

Trichiurus muticus, *Gray, Zool. Misc.* p. 10; *Griff. Anim. Kingd. Fishes,* p. 349. pl. 6. f. 2.
—— intermedius, *Gray, Zool. Misc.* p. 10; *Richards. Ichth. China,* p. 268.

D. 150*.

The diameter of the eye is one-third the length of the snout, and equals the interorbital space, which is convex. The lateral line scarcely descends towards the belly, and runs anteriorly along the middle of the body. *Ventral fins indicated by a pair of very small scales.*

Sea of China.

a, b. Half-grown. China. From Dr. Cantor's Collection.
c. Fine specimen. China. Presented by J. R. Reeves, Esq.
d. Half-grown. China.
e. Adult. India. Presented by General Hardwicke.—Type of the species.
f. Adult. India. Presented by General Hardwicke.—Named *Trichiurus acutirostris.*
g. Half-grown. Chusan. Presented by the Hon. East India Company.
h. Adult. (Atlantic?)
i. Adult. From the Haslar Hospital.
k. Adult: bad state. From the Haslar Hospital.
l–n. Half-grown: very bad state. From the Haslar Hospital.
o. Adult: not good state.

5. **Trichiurus haumela.**

Willughby, App. pl. 3. f. 3.
Clupea haumela, *Forsk.* p. 72; *L. Gm.* p. 1408.
Trichiurus lepturus, *Lacép.* ii. pl. 7. f. 1 (not *Cuv.*).
Russell, pl. 41.
Trichiurus haumela, *Bl. Schn.* p. 518; *Cuv. & Val.* viii. p. 249; *Rüpp. N. W. Fische,* p. 41; *Cant. Catal.* p. 113; *Bleek. Makr. Verh. Bat. Gen.* xxiv. p. 41.

D. 127–133.

The height of the body is 15 to 17 times in the total length, the length of the head 6 to 7 times; the diameter of the eye is $2\frac{1}{5}$ in the length of the snout. Silvery: back blackish.

Indian Ocean and Archipelago.

a. Adult: skin. Malayan Peninsula. From Dr. Cantor's Collection.
b. Half-grown: not good state. Amboyna. Purchased of Mr. Frank.

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* The rays on the extremity of the tail are scarcely perceptible, but they are included in the above number.

6. Trichiurus lajor.

Bleeker, Celebes, v. p. 248.

D. 128.

The height of the body is 16 times in the total length, the length of the head 8 times; the length of the snout is not quite twice the diameter of the eye. Silvery. (*Bleek.*)

Sea of Manado.

4. EPINNULA.

Epinnula, *Poey, Memor. Cub.* p. 369.

Body rather elongate; cleft of the mouth wide. The first dorsal continuous, with the spines of moderate strength, and extending on to the second; spurious fins none; ventrals well developed. Scales minute; lateral lines two. Teeth of the jaws strong; on the palatine bones none. No keel on the tail. Seven branchiostegals. Air-bladder present. Pyloric appendages in moderate number.

Caribbean Sea.

1. Epinnula magistralis.

Poey, l. c. tab. 32. f. 3, 4.

D. 15 | $\frac{1}{16}$. A. $\frac{3}{13}$. V. 1/5. Cæc. pylor. 10.

Ventral fins situated behind the pectorals. The upper maxillary reaches to below the middle of the eye. Coloration uniform. (*Poey.*)

Havannah.

5. DICROTUS*.

Body rather elongate, compressed; cleft of the mouth wide. The first dorsal continuous, with the spines of moderate strength, and extending on to the second; finlets none. Ventral reduced to a long crenulated spine. Præoperculum with several spines at the angle. Body naked. Several strong canines in the jaws; minute teeth on the vomer and the palatine bones. No keel on the tail. Seven branchiostegals. Pseudobranchiæ.

Hab. —— ?

1. Dicrotus armatus.

D. 18 | 18. A. $\frac{2}{16}$. V. 1.

The height of the body is $6\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{5}$. The maxillary reaches to below the anterior margin of the eye; præoperculum with two spines at the angle; operculum terminating in two obtuse points, separated by a notch. The dorsal spines are of moderate strength, and tubercular; the second to the fifth are the longest, and as high as the body; the posterior ones gradually decrease in length; caudal forked; anal spines short; pectoral of moderate length. Each ventral spine is inserted in advance of the pectoral; it is tubercular, very long, its length being equal to the height of the body. The vent is situated far backwards, and its distance from the head is more than the length of the latter. Scales apparently none; lateral line bent downwards anteriorly. Uniform silvery.

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* δίκροτος, with two oars.

a. The specimen is only $2\frac{1}{3}$ inches long, and apparently young; therefore several of the characters mentioned may be modified in a mature state.

6. THYRSITES.

Thyrsites, *Cuv. & Val.* viii. p. 196.

Body rather elongate; cleft of the mouth wide. The first dorsal continuous, with the spines of moderate strength, and extending on to the second. Two to six spurious fins behind the dorsal and anal. The greater portion of the body naked. Several strong teeth in the jaws; teeth on the palatine bones. No keel on the tail. Seven branchiostegals. Air-bladder present. Pyloric appendages in moderate number.

Seas between the tropics. Mediterranean.

1. Thyrsites atun.

Scomber atun, *Euphrasen, Vetensk. Acad. Nya Handl.* xii. *Stockh.* 1791, p. 315.

Acinacée bâtarde, *Bory St. Vinc. Voy.* i. pl. 4. f. 2.

Thyrsites atun, *Cuv. & Val.* viii. p 196. pl. 219; *Cuv. Règne Anim. Ill. Poiss.* pl. 49. f. 1.

—— altivelis, *Richards. Proc. Zool. Soc.* 1839, p. 99.

? Thyrsites chilensis, *Cuv. & Val.* viii. p. 204; *Gay, Hist. Chil. Zool.* ii. p. 226.

$$\text{D. } 20 \left| \frac{1}{10} \right| \text{VI.} \quad \text{A. } \frac{1}{10} \left| \text{VI.} \right. \quad \text{Vert. 37.}$$

Ventral with one spine and five rays. The height of the body is contained eight times in the total length, the length of the head four times and a half. The lateral line descends abruptly below the posterior part of the spinous dorsal. Coloration uniform.

Coasts of South Africa and Van Diemen's Land [and of Chile ?].

a. Thirty-five inches long: stuffed. Cape of Good Hope.

b. Adult: has been in chloride of zinc. Van Diemen's Land. From the Haslar Collection.—Type of *Thyrsites altivelis*, Richards., which is said (*l. c.*) to differ from *Th. atun* "radiis corpus altitudine æquantibus." I find the longest ray considerably lower than the body. I cannot find also seven spurious fins, as stated by Sir J. Richardson, but six only.

2. Thyrsites lepidopoides.

Cuv. & Val. viii. p. 205. pl. 220; *Less. Voy. Coq. Zool. Poiss.* p. 158. pl. 15; *Gay, Hist. Chil. Zool.* ii. p. 228.

$$\text{D. } 17 \left| \frac{2}{14} \right| \text{V} \quad \text{A. } \frac{2}{15} \left| \text{IV.} \right.$$

Ventral with one spine and five rays. The height of the body is one-sixth of the total length, the length of the head one-fourth. The lateral line nearly straight. Coloration uniform.

Coast of Brazil.

3. Thyrsites pretiosus.

Ruvettus pretiosus, *Cocco, Giorn. Sc. Lett. Sicil.* xlii. p. 21, and *Nuov. Giorn. Lett. Pisa,* fasc. lxxiii. p. 32; *Bonap. Faun. Ital. Pesci,* cum tab.

Tetragonurus (?) simplex, *Lowe, Proc. Zool. Soc.* 1833, p. 143.

Aplurus simplex, *Lowe, Trans. Zool. Soc.* ii. p. 180.

Rovetus temminckii, *Cantr. Journ. Acad. Sc. et Belles-Lettres de Brux.* 1835, x. pl. 1.

Thyrsites acanthoderma, *Lowe, Proc. Zool. Soc.* 1839, p. 78.

Rovettus temminckii, *Valenc.* in Webb & Berthel. Poiss.* p. 52. pl. 2.

Thyrsites scholaris, *Poey, Memor. Cuba,* p. 372. t. 32. f. 1, 2.

D. 14–15 | 16–18 | II. A. 16–18 | II. V. 1/5. Cæc. pylor. 14.

Lateral line none. Skin with many bony dermal productions, each terminating in several spines. Abdomen keeled. The height of the body is one-sixth of the total length, the length of the head one-fourth. Uniform purplish-brown or violet-black.

Mediterranean; Seas of Madeira and of the Canary Islands; Caribbean Sea.

a. Fifty-four inches long: stuffed. From the Collection of the Zoological Society.

b. Adult: stuffed. From the Collection of the Zoological Society.

c. Adult: stuffed. Mediterranean. From the Senckenberg Museum.

I am well aware of the slight differences, which, from the accounts quoted, would appear to exist between the fishes from the west and east of the Atlantic, but I have fully convinced myself that they are merely accidental in the individuals.

4. Thyrsites prometheus.

? Gempylus prometheus, *Cuv. & Val.* viii. p. 213. pl. 222.

Prometheus atlanticus, *Lowe, Trans. Zool. Soc.* ii. p. 181, and *Proc. Zool. Soc.* 1839, p. 78.

Gempylus prometheus, *Webb & Berthel. Iles Canar. Poiss.* p. 51. pl. 11†.

D. 18 | 21 | II (III.). A. 16 | II. (III.).

The ventral is reduced to a small spine, and placed a little before the pectoral. The height of the body is eight times in the total length, the length of the head 4½. The lateral line descends in a strongly oblique line below the anterior portion of the spinous dorsal. Coloration uniform; the spinous dorsal blackish.

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* "Ayant appris par M. Cantraine qu'il avait le projet de faire cette dédicace à ce savant, je me suis fait un vrai plaisir de donner aussi à M. Temminck cette nouvelle preuve de mon amitié en conservant ce nom spécifique a ce poisson, ne regardant pas la publication antérieure comme assez répandue pour faire autorité sur cette matière."—*Valenciennes, l. c.*

† This figure differs from that of *Cuv. & Val.* in representing a fish with a relatively shorter head, and with two spurious fins above and beneath; it agrees better with our specimen.

Sea of Madeira (and of St. Helena ?).

a. Adult. Madeira. From the Rev. R. T. Lowe's Collection.

5. Thyrsites solandri.

Gempylus solandri, *Cuv. & Val.* viii. p. 215.

D. 18 | $\frac{1}{18}$ | II. A. 1/18 | II.

The ventral is reduced to a single spine. The height of the body is $5\frac{1}{3}$ in the total length. Coloration uniform. (*Cuv.*)

Coast of New Holland.

6. Thyrsites prometheoides.

Bleeker, Act. Soc. Sc. Indo-Nederl. i. *Amboina*, p. 42.

D. 18 | $\frac{2}{15}$ | II. A. $\frac{2}{14}$ | II.

The ventral is reduced to a single spine, below the base of the pectoral. The height of the body is $7\frac{1}{3}$–$7\frac{1}{4}$ in the total length, the length of the head four times. The lateral line bifurcates below the fifth dorsal spine, the upper branch running near the dorsal profile, and lost below the soft dorsal fin; the inferior branch descends in a curve to the middle of the side. Coloration uniform; the spinous dorsal with a black blotch anteriorly. (*Bl.*)

Sea of Amboyna.

7. GEMPYLUS.

Gempylus, *Cuv. & Val.* viii. p. 207.

Body very elongate; cleft of the mouth very wide. The first dorsal continuous, with thirty or more spines, and extending on to the second. Six spurious fins behind the dorsal and anal. Body scaleless. Several strong teeth in the jaws, none on the palate. No keel on the tail. Seven branchiostegals. Air-bladder present. Pyloric appendages in moderate number.

Seas between the tropics.

1. Gempylus serpens.

Sloane, Jamaica, pl. 1. f. 2.
Scomber serpens, *Solander*.
Gempylus serpens, *Cuv. & Val.* viii. p. 207; *Cuv. Règne Anim. Ill. Poiss.* pl. 49. f. 2.

D. 31 | 13 | VI. A. 10 | VI.

The ventral is reduced to a very small spine. The height of the body is one-fifteenth of the total length, the length of the head one-fifth. Coloration uniform; the upper part of the dorsal black. (*Cuv.*)

Tropical parts of the Atlantic, especially the Caribbean Sea.

2. Gempylus coluber.

Gempylus coluber, *Cuv. & Val.* viii. p. 211. pl. 221.
Lemnisoma thyrsitoides, *Less. Voy. Coq. Zool. Poiss.* p. 160.

D. 30–31 | $\frac{0-1}{11}$ | VI. A. $\frac{3}{12}$ | VI. Cæc. pylor. 9–10.

The ventral is reduced to a very small spine. The height of the body is contained seventeen times in the total length, the length of the head five times and a half. Coloration uniform. (*Cuv.*)

Sea of Otaheite.

Perhaps identical with the other species.

Alepidosaurus, Lowe, has been considered as a fish most closely allied to the family of *Sphyrænidæ* or *Trichiuridæ*. The similarity, however, is merely external, and its natural affinity is decidedly Siluroid.

The rays of the dorsal fin are soft, composed of joints; there is a large adipose fin on the back; the ventrals are abdominal, composed of one toothed spine and nine rays. The suboperculum is absent; the margin of the upper jaw is formed entirely by the intermaxillary bone; the maxillary bone is rudimentary. The pyloric appendages are absent.

Fam. 16. SCOMBRIDÆ.

Scomberoidei, pt., *Cuv. Règne Anim.*; *Müller, Berl. Abhandl.* 1844, p. 201; *Owen, Lect. on Compar. Anat. Vert.* i. p. 49.

Body generally elongate, compressed, naked, or covered with scales of small or moderate (*Nomeina*) size; eye lateral. Dentition variable. The infraorbital bones do not articulate with the præoperculum. The spinous dorsal less developed than the soft or than the anal, either continuous with, or separate from the soft portion, sometimes entirely absent. The soft dorsal and the anal sometimes divided posteriorly into finlets. Ventrals thoracic*, sometimes rudimentary or entirely absent. No prominent papilla near the vent. Gill-opening wide; generally seven branchiostegals, pseudobranchiæ†, and an air-bladder‡; pyloric appendages *generally* in great number. Vertebræ $\frac{(10)\ 10+x}{14+y}$.

Inhabitants of the high seas of nearly all the regions, many of the species having a very wide range.

This family, in its present shape, comprises the smaller part only of Cuvier's *Scomberoidei*. I have separated from them all those fishes in which the vertebral column is composed of 10/14 vertebræ: even after this natural division, *Carangidæ*, is excluded, the remaining genera show considerable differences between themselves: I have endeavoured to form groups corresponding to the principal types. Several of the genera appear to approach the *Trachinidæ*, but these will always be found to possess certain characters in which they differ essentially from that family.

Synopsis of the Groups.

Dorsal fin with the spinous portion separate, and much less developed than the soft. Body oblong, without or with very small scales	A. **Scombrina.**
Dorsal fin with a distinct spinous portion, separated from, or continuous with the soft, which is the more developed. Body oblong, covered with cycloid scales§ of moderate size	B. **Nomeina.**
Dorsal fin formed by two distinct divisions, the spinous less developed than the soft. Body elevated, with very small or rudimentary scales	C. **Cyttina.**

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* Jugular in *Pteraclis* and *Hypsiptera*. † Absent in *Coryphæna*

‡ Absent in *Elacate*, *Echeneis*, *Stromateus*, and *Coryphæna*.

§ See *Platystethus*.

One long dorsal fin, without distinct spinous division; tooth-like processes extend into the œsophagus	D. **Stromateina.**
One long dorsal fin, without distinct spinous division; no teeth in the œsophagus	E. **Coryphænina.**

Synopsis of the Genera.

First group: **Scombrina.** *Scombridæ* with two dorsal fins, the spinous portion being separate, and much less developed than the soft. Body oblong, without or with very small scales.

Five or six finlets; scales equally covering the whole body; two slight ridges on each side of the tail	1. Scomber
Six to nine finlets; scales of the pectoral region forming a corslet; a keel on each side of the tail; teeth rather small; vomerine and palatine teeth	2. Thynnus
Seven to nine finlets (six); scales of the pectoral region forming a corslet; a keel on each side of the tail; teeth of moderate strength; palatine teeth	3. Pelamys
Seven to nine finlets; scales of the pectoral region forming a corslet; a keel on each side of the tail; teeth very small, none on the palate	4. Auxis
Seven or more (rarely less) finlets; body naked or with rudimentary scales; a keel on each side of the tail; teeth strong	5. Cybium
Finlets none; the first dorsal reduced to a few free spines; a keel on each side of the tail	6. Naucrates
Finlets none; the first dorsal reduced to some free spines; ventrals thoracic; caudal keel none	7. Elacate.
The spinous dorsal modified into a sucking organ, situated on the head	8. Echeneis.
Ventrals jugular	9. Hypsiptera.

Second group: **Nomeina.** *Scombridæ* with a distinct spinous portion of the dorsal fin, separated from, or continuous with the soft, which is the more developed. Body oblong, covered with cycloid scales of moderate size.

Ventrals very long; tail with many finlets; mouth wide.	10. Gasterochisma
Ventrals long; mouth narrow	11. Nomeus.
Two dorsals; pectoral longer than the ventral; teeth small; snout swollen	12. Cubiceps.
Two dorsals; pectoral longer than the ventral; teeth minute; snout subconical	13. Neptomenus.
Two dorsals; pectoral and ventral rather short; teeth minute	14. Platystethus
A single dorsal, with the posterior spines longest	15. Ditrema

Third group: **Cyttina.** *Scombridæ* with two distinct divisions of the dorsal fin, the spinous less developed than the soft. Body elevated, covered with very small or rudimentary scales or with bony protuberances.

Bony plates along the base of the dorsal and anal fins ...	16. Zeus.
Base of the fins not armed	17. Cyttus.
Body with large, conical, bony protuberances	18. Oreosoma.

Fourth group: **Stromateina.** *Scombridæ* with one long dorsal fin without distinct spinous division. Toothed processes extend into the œsophagus.

Ventrals none in an adult state; body more or less elevated	19. Stromateus.
Ventrals well developed; body more or less oblong	20. Centrolophus.

Fifth group: **Coryphænina.** *Scombridæ* with one long dorsal fin without distinct spinous division. No teeth in the œsophagus.

Ventrals thoracic, 1/5. Dorsal many-rayed, beginning on the occiput. Scales very small. Præoperculum entire.	21. Coryphæna.
Ventrals thoracic, 1/5. Dorsal beginning on the back. Scales rather small. Præoperculum entire	22. Brama.
Ventrals subjugular, 1/5. Scales large, provided with a hook; præopercular margin spiny	23. Taractes.
Ventrals jugular, four-rayed. Dorsal beginning on the forehead. Scales of moderate size	24. Pteraclis.
Ventrals thoracic or subjugular, 1/5. Scales minute. Præopercular margin spiny	25. Schedophilus.
Ventrals slender, subjugular. Dorsal beginning on the neck, composed of unarticulated widely-set spines. Scales minute, granular	26. Diana.
Ventrals thoracic, rudimentary. Dorsal occupying the posterior half of the back	27. Ausonia.
Ventrals thoracic, 1/5. Dorsal beginning on the back. Scales none..	28. Mene.
Ventrals many-rayed..	29. Lampris.

First Group. SCOMBRINA.

Scombridæ with two dorsal fins, the spinous portion being separate, and much less developed than the soft. Body oblong, without or with very small scales.

1. SCOMBER*.

Scomber, sp., *Artedi, Genera*, p. 30.
Scomber, *Cuv. Règne Anim.*; *Cuv. & Val.* viii. p. 6.

Body rather elongate; cleft of the mouth wide. The first dorsal continuous, with feeble spines, separated from the second by an interspace; five or six spurious fins behind the dorsal and anal fins. Scales very small and equally covering the body. Teeth small, in the jaws, on the vomer and the palatine bones. Two slight ridges on each side of the root of the caudal. Seven branchiostegals. Air-bladder simple, sometimes absent. Pyloric appendages in exceedingly great number.

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* 1. Scomber delphinalis, (*Commers.*) *C. & V.* viii. p. 53.—Madagascar.
2. —— japonicus, *Houtt. Mém. Harl.* xx. p. 331; *C. & V.* viii. p. 54.—Japan.
3

Inhabitants of nearly all the temperate and tropical seas; not yet found on the coasts of the temperate parts of South America.

1. Scomber scomber.

The Mackerel. Die Makreele.

Σκόμβρος, *Aristot.* vi. c. 17, viii. c. 12 & 13, ix. c. 2; *Ælian.* xiv. cap. 1; *Athen.* iii. 121, vii. 321; *Oppian. Halieut.* i. fol. 108, 109.

Scomber, *Ovid. Halieut.* v. 94; *Plin.* ix. c. 15, xxxi. c. 8, xxxii. c. 11; *Martial,* iii. ep. 2, iv. ep. 86, xiii. ep. 1; *Rondel.* viii. c. 7. p. 234; *Salvian.* f. 239. b. 241, 242; *Gesner,* fol. 57; *Schonev.* p. 66; *Aldrov.* ii. c. 53. p. 270; *Willughby,* p. 181. tab. M. 3; *Ray,* p. 58; *Ström, Söndm.* ii. p. 295.

Scomber, no. 1, *Artedi, Genera,* p. 30; *Species,* p. 68.

—— scomber (scombrus), *L. Syst.* i. p. 492; *Brünn.* p. 68; *Bl.* taf. 54; *Bl. Schn.* p. 24; *Lacép.* iii. p. 24; *Donov. Brit. Fishes,* v. pl. 120; *Penn. Brit. Zool.* iii. p. 332. pl. 51; *Pall. Zoogr. Rosso-Asiat.* iii. p. 215; *Risso, Ichth. Nice,* p. 170, and *Eur. Mérid.* iii. p. 412; *Martens, Reise nach Venedig,* ii. p. 432; *Cuv. & Val.* viii. p. 6; *Fries och Ekström, Skand. Fisk.* p. 128. tab. 29; *Parn. Fishes Frith of Forth,* p. 50; *Yarrell, Brit. Fishes,* 2nd edit. i. p. 137; *Cuv. Règne Anim. Ill. Poiss.* pl. 45. f. 1; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 391; *Owen, Osteolog. Catal.* i. p. 61.

Scomber, sp., *Gronov. Zoophyl.* no. 304.

Pelamys, sp., *Klein, Pisc. Miss.* v. p. 12. no. 5. tab. 4. f. 1.

Duhamel, Pêches, sect. vii. pl. 1. f. 1; *Low, Fauna Orcad.* p. 218; *Cetti, Hist. Nat. Sard.* iii. p. 190.

Scomber vernalis, *Mitch. Trans. Lit. & Phil. Soc. New York,* i. p. 423; *Cuv. & Val.* viii. p. 48; *Storer, Fish. Massach.* p. 41; *Dekay, New York Fauna, Fishes,* p. 101. pl. 12. f. 34; *Richards. Faun. Bor. Amer. Fishes,* p. 80 (Scomber grex et vernalis).

Cordylus scombrus, *Gronov. Syst. ed. Gray,* p. 163.

$$\text{D. } 11\,(-14)\,\Big|\,\tfrac{1}{10}\,\Big|\,\text{V.}\quad \text{A. } 1\,\Big|\,\tfrac{1}{11}\,\Big|\,\text{V.}\quad \text{Vert. } 14/17.$$

Scales exceedingly small. The height of the body is $6\frac{2}{3}$ in the total length, the length of the head $4\frac{1}{2}$; the diameter of the eye is one-fifth of the latter. Back bluish, with about thirty waving black transverse streaks. Air-bladder none.

From the Mediterranean along all the coasts of Europe, crossing the Atlantic, and found on the American coasts of the same latitudes.

a. Half-grown. Dalmatia.
b. Half-grown. Lisbon.
c, *d*. Fine specimens. English coast. Purchased.

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3. Scomber auratus, *Houtt. Mém. Harl.* xx. p. 331; *C. & V.* viii. p. 55.—Japan.
4. —— diego, *Ayres, Proc. Calif. Acad. Nat. Sc.* i. 1857, p. 92.—I regret that I have not had access to this journal.
5. —— punctatus, *Couch, Rep. Penz. Nat. Hist. Soc.* 1848, pl. 3. f. 1, cop. by *Yarr. Brit. Fish.* 3rd edit. ii. p. 207.—Cornish coast.

e. Adult: stuffed: bad state. Thames.
f. Adult female: skin. South Devon. From Mr. Yarrell's Collection.
g, *h*. Adult: skins. English coast.
i. Adult: stuffed. Frith of Forth.
k. Adult. ton, U. S. Presented by B. Winstone, Esq.
l. Adult. Boston, U. S. Presented by B. Winstone, Esq.
m, *n*. Adult: skins.
o, *p*. Adult: skins. From Mr. Yarrell's Collection.
q. Young.
r. Half-grown: skin. From Mr. Yarrell's Collection.—The posterior spurious dorsal and anal fins divided into two.
s. Half-grown: skin. From Gronow's Collection.
t, *u*. Adult: skeletons.

Skeleton.—The upper surface of the head is rather flat anteriorly and between the orbits, whilst five ridges run along its posterior portion. The middle of these ridges is obtuse, and formed by the suture of the frontal bones; it is continued over the occipital, but very feeble. The bones situated on the side of this crest are very thin, but not pierced as in the Tunny. The vomer and the palatine bones are rather broad, and the former is slightly concave along its medial line. The jaw-bones are thin: the maxillary is broadest in the middle, without supplementary bone; the intermaxillary tapers from its base towards its extremity, and has the posterior processes very short. There is a wide open space between the articular and the dentary bones of the mandibula; muciferous channel none. The præoperculum is very broad, the space between its margin and interior ridge being unusually wide. The operculum is irregularly shaped; it has an upper rounded margin, a slight posterior notch, and an acute inferior angle. The suboperculum has a nearly vertical situation, and the interoperculum a horizontal one, so that their margins form nearly a right angle. The præorbital is elongate, subelliptical, semitransparent.

The suprascapula is bifurcate, and much longer than the scapula; the radius has a small ovate opening; a wide free space between ulna and humerus. The coracoid is broad, tapering inferiorly. Each of the pubic bones is formed by three feeble lamellæ; they diverge anteriorly, because they are not fixed to the symphysis of the humeral bones, but to each of them separately.

There are fourteen abdominal and seventeen caudal *vertebræ*, both portions being of nearly equal length. The vertebræ are rather elongate, and there is no keel visible on the posterior of the caudal portion; the neural and hæmal spines are frail, and the interneurals and interhæmals very short and feeble. The ribs are well developed, and provided with epipleurals; the eleventh to the fourteenth vertebræ have the hæmal canal completely closed, the ribs being suspended at its abdominal side, close together, whilst the epipleurals are fixed at the centre of the vertebræ. This arrangement is still more developed in *Thynnus thynnus*; and Cuvier says that the latter fish has two series of ribs on each side. The first interhæmal is suspended at the fifteenth vertebra.

2. Scomber pneumatophorus.

Scomber pneumatophorus, *De la Roche, Ann. Mus. Hist. Nat.* xiii. pp. 315, 334; *Cuv. & Val.* viii. p. 36; *Guichen. Explor. Algér. Poiss.* p. 56.
—— grex, *Mitch. Trans. Lit. & Phil. Soc. New York*, p. 422; *Cuv. & Val.* viii. p. 45; *Dekay, New York Faun. Fishes*, p. 103. pl. 11. f. 32.
? Scomber capensis, *Cuv. & Val.* viii. p. 56.
? Scomber pneumatophorus major, *Faun. Japon. Poiss.* p. 94. pl. 47. f. 1.
? Scomber saba, *Bleek. Japan*, p. 405, and *Verhand. Batav. Genootsch.* xxvi. p. 95.

$$\text{D. } 10 \left| \frac{1}{11} \right| \text{V.} \quad \text{A. } 1 \left| \frac{1}{11} \right| \text{V.} \quad \text{L. lat. ca } 200. \quad \text{Vert. } 31.$$

The height of the body is $5\frac{1}{4}$ in the total length, the length of the head $4\frac{1}{2}$; the diameter of the eye is $3\frac{1}{2}$ to $4\frac{1}{2}$ in the latter. Greenish; back with about thirty waving black transverse streaks. An air-bladder.

From the Mediterranean, southwards to the Cape of Good Hope, crossing the Atlantic, and found on the American coasts of the same latitudes. [Sea of Japan ?]

a. 26 inches long: stuffed. Cape Seas. From Sir A. Smith's Collection.
b, c. Adult: stuffed. St. Helena. From Sir A. Smith's Collection.
d. Half-grown: not good state. Madeira. Presented by the Rev. R. T. Lowe.

3. Scomber janesaba.

Scomber pneumatophorus minor, *Faun. Japon. Poiss.* p. 94. pl. 47. f. 2.
—— janesaba, *Bleek. Japan*, p. 406, and *Verhand. Batav. Genootsch.* xxvi. *Japan*, p. 96.

$$\text{D. } 9\text{–}10 \left| \frac{1}{11} \right| \text{V–VI.} \quad \text{A. } 1 \left| \frac{1}{10\text{–}11} \right| \text{V–VI.}$$

Scales small, conspicuous. The height of the body is $6\frac{1}{3}$–$6\frac{2}{3}$ in the total length, the length of the head four times; the diameter of the eye is $3\frac{1}{3}$–$3\frac{1}{2}$ in the latter. Back with greenish-violet spots and waving transverse streaks; sides and belly silvery. An air-bladder.

Sea of Japan.

4. Scomber australasicus.

Scomber scombrus, *Solander in L. Syst.* i. p. 492.
—— australasicus, *Cuv. & Val.* viii. p. 49.

$$\text{D. } 10 \left| \frac{1}{11} \right| \text{V.} \quad \text{A. } 1 \left| \frac{1}{11} \right| \text{V.} \quad \text{L. lat. ca } 160.$$

The height of the body is $5\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{4}$. Teeth very distinct. Back greyish-green, sides and belly silvery.

Seas of Australia and Amboyna.

a. Adult. Port Jackson. Presented by the Lords of the Admiralty
b. Adult: skin. Swan River. Voyage of H.M.S. Fly.
c. Young. Amboyna. Purchased of Mr. Frank.

5. Scomber loo.

Cuv. & Val. viii. p. 52; *Bleek. Verh. Bat. Genootsch.* xxiv. *Makr.* p. 35; *Less. Voy. Coq. Zool. Poiss.* p. 166. pl. 33; [?*Richards. Ann. & Mag. Nat. Hist.* 1843, xi. p. 23.]

$$\text{D. } 9\text{–}10 \mid 11\text{–}12 \mid \text{V.} \quad \text{A. } 1 \left| \frac{1}{9} \right| \text{V.}$$

Scales small, very conspicuous. The height of the body is $4\frac{2}{3}$–$4\frac{4}{5}$ in the total length, the length of the head $4\frac{1}{2}$–$4\frac{3}{4}$. Above bluish-green, beneath silvery; back with round blackish spots along the base of the fins. Dorsal fins with a black margin.

From the Molucca Sea to Polynesia.

6. Scomber moluccensis.

Bleeker, Acta Soc. Scient. Indo-Nederl. i. *Amboina*, p. 40.

$$\text{D. } 9 \mid 10 \mid \text{V.} \quad \text{A. } 1 \left| \frac{1}{8\text{–}10} \right| \text{V–VI.}$$

Scales very small, conspicuous. The height of the body is 5–$5\frac{1}{3}$ in the total length, the length of the head $4\frac{1}{4}$–$4\frac{2}{5}$. Above greenish, with round greenish-violet spots, arranged in two or three longitudinal series; sides and belly silvery; fins immaculate. (*Bl.*)

Sea of Amboyna.

This species is probably identical with *Sc. loo*.

7. Scomber chrysozonus.

Rüppell, N. W. Fische, p. 37. tab. 11. f. 1.

$$\text{D. } 9 \left| \frac{1}{11} \right| \text{V.} \quad \text{A. } \frac{1}{11} \left| \text{V.} \right.$$

Scales small, conspicuous. The height of the body is four times in the total length, the length of the head $3\frac{1}{2}$. Bluish-green, vertex spotted with black; two metallic shining spots behind each eye, disappearing after death. Back and sides with longitudinal stripes; two round blackish spots behind the pectoral; a series of four or five black spots along the base of the spinous dorsal. (*Rüpp.*)

Red Sea.

8. Scomber kanagurta.

Kanagurta, *Russell*, ii. p. 21. pl. 136.

Scomber kanagurta, *Cuv. Règne Anim.*; *Rüpp. Atl. Fische*, p. 93, and *N. W. Fische*, p. 37; *Cuv. & Val.* viii. p. 49; *Bleeker, Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 35; *Peters, Wiegm. Arch.* 1855, p. 245.

$$\text{D. } 8\text{–}9 \left| \frac{1}{11} \right| \text{V.} \quad \text{A. } 1 \left| \frac{1}{11} \right| \text{V.} \quad \text{Vert. } \frac{14}{16}.$$

Scales small. The height of the body is four times in the total length, the length of the head $3\frac{1}{3}$. Above uniform greenish, on the sides and the belly silvery. An air-bladder.

Red Sea; Indian Seas.

9. Scomber brachysoma.

Bleeker, Makr. p. 356.

D. 10 | $\frac{1}{11}$ | V. A. 1 | $\frac{1}{10}$ | V.

Scales small, conspicuous. The height of the body is a little more than three times in the total length, the length of the head 3¾. Teeth of the jaws inconspicuous. Above greenish; beneath silvery, immaculate. (*Bl.*)

Sea of Batavia.

10. Scomber colias.

The Spanish Mackerel.
? Colias, *Plin.* xxxii. c. 11; *Bellon.* p. 202; *Rondel.* p. 235; *Salv.* f. 242.
Colias rondeletii, *Ray, Syn.* p. 59.
Scomber colias, *L. Gm.* i. p. 1329; *Bl. Schn.* p. 22; *Lacép.* iv. pp. 39, 40; *Risso, Ichth. Nice*, p. 171, and *Eur. Mérid.* iii. p. 413; *Cuv. & Val.* viii. p. 39. pl. 209; *Turton, Brit. Faun.* p. 100; *Yarrell, Brit. Fishes*, i. p. 148; *Storer, Fishes of Massach.* p. 45; *Dekay, New York Fauna, Fishes*, p. 104. pl. 11. f. 33; *Lowe, Proceed. Zool. Soc.* 1850, p. 248.
—— maculatus, *Couch, Mag. Nat. Hist.* v. p. 22. f. 8.

D. 7 | $\frac{1}{12}$ | V. A. 1 | $\frac{1}{12}$ | V. Vert. 31.

Scales of the pectoral region conspicuously larger than the others. Back with irregular reticulated dark lines; sides with greyish spots. An air-bladder.

Mediterranean; South coasts of England and Ireland; Atlantic coasts of Europe and of the United States.

a. Fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.

11. Scomber microlepidotus.

Rüppell, N. W. Fische, p. 38. taf. 11. f. 2; *Cantor, Catal.* p. 105.

D. 10 | 12 | V. A. $\frac{1}{11}$ | V.

Scales minute, those of the pectoral region a little larger. The height of the body is 4⅓ in the total length, and equals the length of the head; caudal fin small. Two or three series of indistinct brownish dots along the vertex and the back.

Red Sea; Seas of Pinang and China.

a. Adult. China. Presented by J. R. Reeves, Esq.
b. Young: skin. Sea of Pinang. From Dr. Cantor's Collection.

12. Scomber tapeinocephalus.

Bleeker, Japan, p. 407, and *Verhand. Batav. Genootsch.* xxvi. *Japan*, p. 97. pl. 7. f. 2.

D. 11 | $\frac{1}{11}$ | V–VI. A. 1 | $\frac{1}{11}$ | V–VI.

Scales small, conspicuous, those of the pectoral region larger than the others. The height of the body is seven times in the total length.

the length of the head $4\frac{1}{5}$. Teeth conspicuous. Back and sides with greyish-violet spots and waving transverse streaks. An air-bladder. (*Bl.*)

Sea of Japan.

2. THYNNUS*

Thynnus, *Cuv. & Val.* viii. p. 57.

Body oblong; cleft of the mouth wide. The first dorsal continuous, with the spines rather feeble or of moderate strength, extending on to the second dorsal; six to nine spurious fins behind the dorsal and anal. Scales of the pectoral region forming a corslet. Teeth rather small, present in the jaws, on the vomer and the palatine bones. A longitudinal keel on each side of the tail. Seven branchiostegals. Air-bladder simple, sometimes absent. Pyloric appendages in exceedingly great number.

Inhabitants of the open sea, and spread over all the tropical and temperate regions.

1. Thynnus thynnus.

The Tunny. Der Thunfisch.
Θύννος, *Aristot.* ii. c. 13, iv. c. 10, v. c. 9–11, vi. c. 17, viii. c. 2. 12. 13. 15. 19. 30, ix. c. 2; *Ælian.* ix. c. 42, xiii. c. 13. 16. 27, xv. c. 3. 5. 6; *Athen.* vii. pp. 122, 301, 316, 319; *Oppian. Hal.* ii. p. 48.
Thunnus, *Ovid. Hal.* v. 98.
Thynnus, *Plin.* ix. c. 15; *Strabo, Geogr.* iii. p. 145, v. p. 223 &c., vii. p. 320 A, xii. p. 545 D, xvii. p. 834.
Thunnus sive Thynnus (Thinnus), *Bellon.* p. 108; *Gesner*, pp. 957, 967, 1148; *Willughby*, p. 176. pl. M. 1. f. 3; *Ray*, p. 57; *Schonev.* p. 75.
Ὀρκύνος, *Ælian.* i. c. 40; *Oppian.* i. c. 8, ii. p. 59; *Athen.* vii. pp. 301, 315.
Orcynus, *Plin.* xxxii. c. 11; *Gesner*, p. 962; *Aldrov.* iii. c. 18. p. 314; *Jonston*, t. 3. f. 4; *Rondel.* p. 249.
Μελάνδρυς, *Athen.* vii. p. 315.
Melandrys, *Plin.* ix. c. 15.
Scomber, no. 2, *Artedi, Genera*, p. 31.
Scomber thynnus, *L. Syst.* i. p. 493; *Bl.* tab. 55; *Bl. Schn.* p. 21; *Lacép.* ii. p. 605; *Donov. Brit. Fishes*, i. pl. 5; *Fleming, Brit. Anim.* p. 218; *Martens, Reise nach Venedig*, ii. p. 432; *Risso, Ichth. Nice*, p. 163.
Duhamel, ii. sect. 7. c. 2; *Cetti, Stor. Nat. di Sard.* iii. p. 138, &c.; *Leguat, Voyage*, p. 23.
Thynnus mediterraneus, *Risso, Eur. Mérid.* iii. p. 414.
—— vulgaris, *Cuv. & Val.* viii. p. 58. pl. 210; *Yarrell, Brit. Fishes*, i. p. 150; *Cuv. Règne Anim. Ill. Poiss.* pl. 45. f. 2; *Storer, Fishes of Massach.* p. 47, cop. by *Dekay, New York Fauna, Fishes*, p. 105.

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* 1. Thynnus atlanticus, *Less. Voy. Coq. Zool.* ii. p. 165.—Thynnus balteatus, *Cuv. & Val.* viii. p. 136.—Tropical parts of the Atlantic.
2. —— obesus, *Lowe, Proc. Zool. Soc.* 1839, p. 78, and *Trans. Zool. Soc.* iii. p. 4.—Sea of Madeira.
3. —— orientalis, *Temm. & Schleg. Faun. Japon. Poiss.* p. 94.—Sea of Japan.
4. —— sibi, *Temm. & Schleg. Faun. Japon. Poiss.* p. 97. pl. 50.—Sea of Japan.

pl. 10. f. 28; *Guichen. Explor. Algér. Poiss.* p. 57; *Owen, Osteolog. Catal.* p. 62.
Thynnus thynnus, *White, Catal. Brit. Fishes*, p. 30.

D. 14 | $\frac{1}{13}$ | IX. A. $\frac{2}{12}$ | VIII. Vert. 16/23.

The height of the body is 4¼ in the total length, the length of the head four times. The pectoral reaches nearly to the end of the spinous dorsal; dorsal spines rather feeble. The posterior margin of the præoperculum is somewhat shorter than the inferior. Above dark bluish; beneath greyish, spotted with silvery.

Mediterranean; Atlantic, between Europe and the United States.

a. Eight feet long: stuffed. Weymouth.
b. Eye of specimen *a* (diameter four inches)
c. Forty-five inches long: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
d. Half-grown: stuffed.
e. Adult: skeleton.

The description of the skeleton has been given by Cuvier. There are sixteen abdominal and twenty-three caudal vertebræ, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·44.

2. Thynnus brachypterus.

? Pelamys vera s. Thunnus Aristotelis, *Rondel.* p. 245.
Ancicoti (Alicorti), *Duhamel, Pêches*, sect. 7. p. 205. pl. 7. f. 5.
Thynnus brachypterus, *Cuv. & Val.* viii. p. 98. pl. 211; *Cuv. Règne Anim. Ill. Poiss.* pl. 46. f. 2.

D. 13 | 1 | $\frac{2}{13}$ | IX. A. $\frac{2}{12}$ | VIII. Vert. 39.

The height of the body is 4¼ in the total length, the length of the head four times. The pectoral reaches to the vertical from the tenth dorsal spine; dorsal spines of moderate strength. The posterior margin of the præoperculum is considerably shorter than the lower. Back dark bluish, with light vertical bands on the side; sides and belly greyish, with waving silvery streaks. (*Cuv.*)

Mediterranean.

3. Thynnus coretta.

Cuv. & Val. viii. p. 102.

D. 13 | 1 | $\frac{2}{12}$ | VIII. A. $\frac{2}{12}$ | VII.

The second dorsal and anal fins are low. The length of the pectoral fin equals one-fifth of the total. The corslet is not continued to the vertical from the anal. Uniform lead-coloured above, silvery beneath. (*Cuv.*)

Caribbean Sea.

4. Thynnus affinis.

Cantor, Catal. p. 106.

D. 15 | $\frac{3}{10}$ | VIII. A. $\frac{3}{11}$ | VII.

The height of the body is 4¼ in the total length, the length of the head $3\frac{3}{4}$. The length of the pectoral is $6\frac{1}{2}$ in the total. Above blue, with oblique undulating blackish bands, directed backwards and upwards; sides and belly silvery; the first dorsal fin with a brownish spot.

Sea of Pinang.

a. Adult: skin. Sea of Pinang. From Dr. Cantor's Collection.—Type of the species.

5. Thynnus tonggol.

Bleeker, Makr. p. 356.

D. $13 \left| \frac{2}{12} \right|$ VIII. A. $\frac{3}{10} \Big|$ VIII.

The height of the body is one-fifth of the total length, the length of the head one-fourth; the length of the pectoral equals the height of the body. The corslet extends on to the soft dorsal and to the anal, having two deep emarginations posteriorly. Above uniform greyish, beneath silvery. (*Bleek.*)

Sea of Batavia.

6. Thynnus thunnina.

Pelamis cærulea, *Aldrov.* p. 315.
Renard, Poiss. Mol. i. tab. 36. f. 189, ? tab. 23. f. 124.
Scomber quadripunctatus, *Geoffr. Descr. Eg. Poiss.* tab. 24. f. 3.
Thynnus leachianus, *Risso, Eur. Mérid.* iii. p. 414.
—— thunnina, *Cuv. & Val.* viii. p. 104. pl. 212; *Faun. Japon. Poiss.* p. 95. pl. 48; *Cuv. Règne Anim. Ill. Poiss.* pl. 46. f. 1; *Bleek. Makr. Verhand. Batav. Genootsch.* xxiv. p. 36; *Guichen. Explor. Algér. Poiss.* p. 57.
—— brasiliensis, *Cuv. & Val.* viii. p. 110.
Auxis taso, *Bleek.* (not *Cuv. & Val.*).

D. $15 \left| \frac{1}{12} \right|$ VIII. A. $\frac{2}{12} \Big|$ VII.

The height of the body is $4\frac{1}{2}$ in the total length (to the centre of the posterior margin of the caudal), the length of the head four times. The pectoral reaches to the vertical from the ninth dorsal spine; dorsal spines of moderate strength. The length of the posterior margin of the præoperculum is $1\frac{1}{2}$ in that of the inferior. Back bluish, with blackish waving longitudinal streaks; sides and belly silvery.

Mediterranean; tropical parts of the Atlantic; East Indian Seas.

a. Half-grown: stuffed.
b. Half-grown: stuffed: bad state. From Mr. Yarrell's Collection.

7. Thynnus pelamys.

The Bonite.
Renard, i. 20. 113; *Osbeck, Reise*, p. 87; *Leguat, Voyage*, p. 21 (fig. bad); *Funnel, Voy. Dampier*, p. 158. f. 32; *Dutertre, Hist. Antilles*, ii. p. 214, p. 295 fig.

Scomber pelamys, *L. Syst. Nat.* i. p. 492; *Bl. Schn.* p. 23; *Bennett, Whaling Voyage,* ii. p. 281; *De la Roche, Ann. Mus.* xiii. p. 315.
—— pelamides, *Lacép.* iii. p. 14 (pt.), ii. pl. 20. f. 2.
Variletta, *Humboldt, Observ. Zool.* ii. p. 190.
Thynnus pelamys, *Cuv. & Val.* viii. p. 113. pl. 214; *Faun. Japon. Poiss.* p. 96. pl. 49; *Richards. Ichth. Chin.* p. 267; *Cuv. Règne Anim. Ill. Poiss.* pl. 47. f. 2; *Bleek. Act. Soc. Nederl.* i. *Amboina,* p. 41; *Yarrell, Brit. Fishes,* i. p. 157.
Thunnus pelamys, *Parn. Fishes Frith of Forth,* p. 53.
Thynnus vagans, *Less. Voy. Coq. Zool.* ii. p. 162. pl. 32 (bad).

D. 15 | $\frac{1}{12}$ | VIII. A. $\frac{2}{12}$ | VII.

The height of the body is four times in the total length (to the centre of the posterior margin of the caudal), the length of the head $3\frac{1}{2}$. The pectoral reaches to the vertical from the tenth dorsal spine. Dorsal spines rather feeble. The length of the posterior margin of the præoperculum is $1\frac{2}{3}$ in that of the inferior. Back bluish; on each side of the belly four brownish longitudinal bands.

Tropical and warmer parts of the Atlantic and Indian Oceans.

a. Adult: stuffed. Cape Seas. From Sir A. Smith's Collection.
b. Thirty-three inches long: stuffed. From Mr. Yarrell's Collection.

8. **Thynnus brevipinnis.**

Cuv. & Val. viii. p. 112. pl. 213.

D. 15 | $\frac{2}{12}$ | VIII. A. $\frac{2}{12}$ | VII. Vert. 38.

The height of the body is four times in the total length (to the centre of the posterior margin of the caudal), the length of the head $3\frac{4}{5}$. The length of the pectoral is one-ninth of the total, and the fin reaches to the vertical from the ninth dorsal spine. Dorsal spines rather feeble. Back bluish, with darker transverse bands; sides and belly silvery. (*Cuv.*)

Mediterranean.

9. **Thynnus albacora.**

? Albacore, *Sloane, Hist. of Jam.* i. p. 28. pl. 1. f. 1.
? Auxis sloanei, *Cuv. & Val.* viii. p. 148.
Tunny, *Penn. Brit. Zool.* ed. 1. iii. p. 266. tab. 52.
Thynnus albacora, *Lowe, Proc. Zool. Soc.* 1839, p. 77, and *Trans. Zool. Soc.* iii. p. 4.

Body elongate; the second dorsal and the anal falcate, and elevated anteriorly; the pectoral reaches to below the middle of the second dorsal, its length being one-fifth or one-fourth of the total. Snout and eye small. (*Lowe.*)

Atlantic.

Thynnus macropterus (Temm. & Schleg. Faun. Japon. Poiss. p. 98. pl. 51; Bleeker, Verhand. Batav. Genootsch. xxiv. Makr. p. 37) appears to be closely allied to, or perhaps identical with, the above species.

10. Thynnus alalonga.

Alilonghi, *Duhamel, Pêches*, ii. sect. 7. p. 203; *Cetti, Hist. Nat. Sard.* iii. p. 191.
Scomber alatunga, *L. Gm. Syst. Nat.* i. p. 1330; *Lacép.* iii. p. 21; *Shaw, Zool.* iv. p. 590.
Orcynus alalonga, *Risso, Eur. Mérid.* iii. p. 419.
Thynnus alalonga, *Cuv. & Val.* viii. p. 120. pl. 215; *Cuv. Règne Anim. Ill. Poiss.* pl. 47. f. 1; *White, Catal. Brit. Fishes*, p. 31; *Yarrell, Brit. Fishes*, ed. 3. ii. p. 220; *Lowe, Trans. Zool. Soc.* iii. p. 4.

D. 14 | $\frac{3}{12}$ | VIII. A. $\frac{3}{12}$ | VIII. Vert. 40.

The height of the body is 4½ in the total length, the length of the head 3½. The pectoral reaches beyond the end of the second dorsal; dorsal spines of moderate strength. Above bluish, beneath silvery.

Mediterranean; Atlantic.

a. Thirty-nine inches long: stuffed. Cape of Good Hope. From Sir A. Smith's Collection.
b. Adult: skin. Atlantic. From Dr. Parnell's Collection.

11. Thynnus pacificus.

Willughby, Append. p. 5. pl. 9. f. 1; ? *Funnel, Damp. Voy.* p. 57. f. 21.
Thynnus pacificus, *Cuv. & Val.* viii. p. 133.
? Scomber germo, *Bennett, Whaling Voyage*, ii. p. 278.

D. 14 | $\frac{3}{12}$ | VIII. A. $\frac{3}{12}$ | VIII.

The height of the body is 3½ in the total length. The pectoral reaches beyond the end of the soft dorsal. Above bluish, beneath silvery. (*Cuv.*)

Pacific (27° & 26° S. Lat., 103° W. Long.); tropical parts of the Indian Ocean.

12. Thynnus argenti-vittatus.

Cuv. & Val. viii. p. 134*.

D. 14 | 14 | IX. A. 11 | IX. (Vert. 41.)

The height of the body is 3½ in the total length, and equal to the length of the pectoral, the basal width of which is 4½ in its length. Above bluish; on the sides and on the belly greyish, spotted with silvery. (*Cuv.*)

Atlantic.

13. Thynnus bilineatus.

? Thynnus bicarinatus, *Quoy & Gaim. Voy. Freyc. Poiss.* p. 357. pl. 61. f. 1 (very bad).
—— bilineatus, *Rüpp. N. W. Fische*, p. 39. pl. 12. f. 2.

D. 12 | $\frac{1}{10}$ | VI. A. $\frac{1}{17}$ | VI.

The lateral line emits a second branch behind the pectoral, descending in a strong curve towards the belly, and running parallel to the ventral line. Coloration uniform. (*Rüpp.*)

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* Cuvier refers a fish (*Alba coretta*, mentioned by Pison, p. 73) to this species, and on the very next page to *Thynnus balteatus*.

Red Sea.

3. PELAMYS.

Pelamys, *Cuv. & Val.* viii. p. 149.

Body oblong or slightly elongate; cleft of the mouth wide. The first dorsal continuous, with the spines rather feeble or of moderate strength, and extending on to the second; seven to nine spurious fins behind the dorsal and anal (six in *P. nuda*). Scales of the pectoral region forming a corslet. Teeth of moderate strength; teeth on the palatines, none on the vomer. A longitudinal keel on each side of the tail. Seven branchiostegals; air-bladder none. Pyloric appendage dendritical.

Seas of the temperate and tropical regions.

1. Pelamys sarda.

Amia, *Rondel.* p. 238.
Sarda, *Rondel.* p. 248 (juv.).
Pelamys, *Salviani,* f. 123; *Bellon.* p. 179.
Thynnus, *Aldrov.* iii. c. 18. p. 313.
Pelamys bellonii, *Willughby,* p. 180.
Scomber, no. 2 (Thynnus thynnus), var., *Artedi, Synon.* p. 50.
—— pelamys, *Brünn. Ichthyol. Massil.* p. 69.
—— sarda, *Bloch,* x. p. 35. taf. 334; *Bl. Schn.* p. 22; *Mitch. Trans. Lit. & Phil. Soc. New York,* i. p. 428; *Lacép.* iv. pp. 699, 700.
—— mediterraneus, *Bl. Schn.* p. 23; *De la Roche, Ann. Mus.* xiii. p. 336.
—— ponticus, *Pall. Zoogr. Rosso-Asiat.* p. 17.
Thynnus sardus, *Risso, Eur. Mérid.* iii. p. 417.
Pelamys sarda, *Cuv. & Val.* viii. p. 149. pl. 217; *Yarrell, Brit. Fishes,* i. p. 159; *Storer, Fishes Massach.* p. 4; *Dekay, New York Fauna, Fishes,* p. 106. pl. 9. f. 27; *Cuv. Règne Anim. Ill. Poiss.* pl. 48. f. 2; *Guichen. Explor. Algér. Poiss.* p. 58; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 392; *Lowe, Proc. Zool. Soc.* 1850, p. 248; *Webb & Berthel. Iles. Canar. Poiss.* p. 50.
Skeleton: *Rosenthal, Ichthyot. Tafeln.* t. 17. f. 3 (Scomber sarda).

$$\text{D. } 22 \left| \frac{2}{13\text{–}14} \right| \text{VIII.–IX.} \quad \text{A. } \frac{2}{13} \Big| \text{VII.} \quad \text{Vert. } 50^{*}.$$

Teeth of moderate size, slightly compressed; the length of the pectoral is one-tenth of the total. The corslet is very distinct, but does not extend beyond the point of the pectoral. Back bluish, with dark oblique streaks; belly silvery. Young individuals with dark cross-bands on the back.

Mediterranean; Atlantic.

a. Adult: stuffed. Cape of Good Hope. Purchased of Sir A. Smith.
b–f. Half-grown: have been in chloride of zinc. North America. Purchased of Mr. Warwick.

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* According to Rosenthal 27/27.

2. Pelamys unicolor.

Scomber unicolor, *Geoffr. Descr. Eg. Poiss.* pl. 24. f. 6.
Cybium bonaparti, *Verany, Atti dell' ottava riunione degli Scienziati Ital. Genova,* 1846, p. 493.
Pelamys unicolor, *Guichen. Explor. Algér. Poiss.* p. 58.
—— bonaparte, *Filippi e Verany in Memor. della R. Accad. Scienze di Torino,* ser. 2. T. xviii. *Sopra alcuni Pesci, &c.* p. 10. f. 4.

D. 11–13 | $\frac{2}{12}$ | VIII–IX. A. $\frac{2}{11}$ | VII.

Teeth of moderate size, rather conical; the length of the pectoral is one-ninth of the total. The corslet is formed by exceedingly small scales, and inconspicuous. Back uniform bluish; belly silvery.

Mediterranean.

a. Thirty-two inches long: stuffed. Purchased at Paris.

3. Pelamys orientalis.

Temm. & Schleg. Faun. Japon. Poiss. p. 99. pl. 52.

D. 18 | 14 | IX. A. 12 | IX.

The length of the pectoral is one-tenth of the total. Back bluish, with nine dark longitudinal streaks; belly silvery. (*Schleg.*)

Sea of Japan.

4. Pelamys nuda.

Renard, taf. 36. f. 189.
Thynnus unicolor, *Rüpp. N.W. Fische,* p. 40. taf. 12. f. 1 (not *Geoffr.*, *Gthr.*).

D. 14 | $\frac{1}{12}$ | VI. A. $\frac{3}{10}$ | VI. Cæc. pylor. 0.

The first dorsal is low; the length of the pectoral is one-seventh of the total. The corslet is not scaly, but formed by waving longitudinal streaks. Coloration uniform, the tips of the dorsal and anal whitish. (*Rüpp.*)

Red Sea.

5. Pelamys chilensis.

Pelamys chilensis, *Cuv. & Val.* viii. p. 163; *Gay, Hist. Chil. Zool.* ii. p. 224.
? Pelamys lineolata, *Girard in U. S. Pacif. R. R. Exped. Fishes,* p. 106.

D. 18 | $\frac{2}{12}$ | VIII. A. $\frac{2}{10}$ | VII.

The length of the pectoral is one-seventh of the total. Back bluish, belly silvery; five or six slightly oblique, longitudinal streaks on the sides.

Pacific.

4. AUXIS.

Auxis, *Cuv. & Val.* viii. p. 138.

Body oblong or slightly elongate; cleft of the mouth wide. The first dorsal continuous, with the spines of moderate strength, and separated from the second by an interspace; seven to nine spurious fins behind the dorsal and anal. Scales of the pectoral region forming a corslet. Teeth very small; none on the palate. A longitudinal keel on each side of the tail. Seven branchiostegals; air-bladder none. Pyloric appendage dendritical.

Seas of the temperate and tropical regions.

1. Auxis rochei.

Scomber rochei, *Risso, Ichth. Nice*, p. 165.
Thynnus rocheanus, *Risso, Eur. Mérid.* iii. p. 417.
Auxis vulgaris, *Cuv. & Val.* viii. p. 139. pl. 216; *Yarrell, Brit. Fishes*, i. p. 160; *Cuv. Règne Anim. Ill. Poiss.* pl. 48. f. 1; *Lowe, Proc. Zool. Soc.* 1850, p. 248.
? Auxis taso, (*Commers.*) *Cuv. & Val.* viii. p. 146.
Auxis bisus, (*Rafin.*) *White, Catal. Brit. Fishes*, p. 32.
—— thynnoides, *Bleeker, Ternate*, v. p. 301.

D. 10–11 | 12 | VIII. A. 12–14 | VII. Vert. 39.

The height of the body is $4\frac{1}{4}$ (in young individuals six times) in the total length, and equals the length of the head. The pectoral reaches to the end of the first dorsal. Back blue, variegated with darker—uniform in old age; belly silvery.

Mediterranean; tropical parts of the Atlantic; East Indian Archipelago.

a. Adult: skin. Jamaica. From Dr. Parnell's Collection.
b. Half-grown. Amboyna. Purchased of Mr. Frank.
c. Adult. From the Collection of the Zoological Society.
d. Adult: stuffed.

2. Auxis tapeinosoma.

Bleeker, Japan, p. 408, and *Verhand. Batav. Genootsch.* xxvi. *Japan*, p. 98. tab. 7. f. 1.

$$\text{D. } 12 \left| \tfrac{1}{9} \right| \text{IX.} \quad \text{A. } \tfrac{3}{11} \Big| \text{VII.}$$

The height of the body is $6\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{3}$. The pectoral does not reach to the vertical from the end of the first dorsal, and its length is $9\frac{1}{3}$ in the total. Back bluish, belly silvery. (*Bleek.*)

Sea of Japan.

5. CYBIUM*

Cybium, *Cuv. Règne Anim.*; *Cuv. & Val.* viii. p. 164.

Body oblong or rather elongate; cleft of the mouth wide. The first dorsal continuous, with the spines rather feeble, and extending on to the second. Generally seven or more spurious fins behind the dorsal and anal. The greater portion of the body naked, or with very small scales, which do not form a corslet. Teeth strong; villiform teeth on the vomer and the palatine bones. A longitudinal keel on each side of the tail. Seven branchiostegals. Air-bladder present.

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* 1 Cybium clupeoideum, (*Brouss.*) *Cuv. & Val.* viii. p. 178.—Norfolk Island.
2. —— mertensii, *Cuv. & Val.* viii. p. 179; *Cuv. Règne Anim. Ill. Poiss.* pl. 48. f. 3.—*Hab.*?
3. Scomber sinensis, *Lacep.* iii. p. 23.—Cybium chinense, *Cuv. & Val.* viii p. 180; *Faun. Japon. Poiss.* p. 100. pl. 53. f. 1.—Chinese and Japanese Seas. 4

Atlantic; Indian Ocean and Archipelago.

1. **Cybium commersonii.**

Scomber commersonii, *Lacép.* ii. p. 600. pl. 20. f. 1; *Shaw, Zool.* iv. p. 589. pl. 85.
—— maculosus, *Shaw, Nat. Misc.* no. 982, and *Zool.* iv. p. 592.
Russell, pl. 135.
Cybium commersonii, *Cuv. Règne Anim.*; *Rüpp. Atl. Fische*, p. 94. taf. 25. f. 1; *Cuv. & Val.* viii. p. 165; *Rüpp. N. W. Fische*, p. 41; *Richards. Ichth. Chin.* p. 268; *Cantor, Catal.* p. 108.
—— konam, *Bleek. Makr.* p. 357.

D. 16 | $\frac{2}{15}$ | IX–X. A. $\frac{2}{15}$ | IX–X.

Teeth triangular, strongly compressed, close together. The height of the body is $5\frac{1}{2}$–7 in the total length, the length of the head 4–5 times. Lateral line curved under the first finlet. Above bluish, beneath silvery; back and sides with numerous oblong, vertical brownish spots.

From the Eastern and Southern coasts of Africa, through all the Indian Seas.

a. Adult: skin. Malayan Peninsula. From Dr. Cantor's Collection.
b. Four feet long: stuffed. Cape Seas. Purchased of Sir A. Smith.

2. **Cybium lineolatum.**

Renard, i. 7. 53.
Cybium lineolatum, *Cuv. & Val.* viii. p. 170; *Bélanger, Voy.* p. 366. pl. 2. f. 1; *Bleek. Verhand. Batav. Genootsch.* xxiv. p. 40; *Cantor, Catal.* p. 110.

D. 16 | 16 | IX. A. $\frac{2}{14}$ | X.

The teeth are triangular, strongly compressed. The height of the body is $6\frac{1}{2}$ in the total length, the length of the head five times. Above blue, beneath silvery; sides with numerous short, blackish, longitudinal streaks.

East Indian Seas.

a. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.

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4. Cybium acervum, *Cuv. & Val.* viii. p. 186.—Caribbean Sea.
5. —— immaculatum, *Cuv. & Val.* viii. p. 191.—Caribbean Sea.
6. —— solandri, *Cuv. & Val.* viii. p. 192.—*Hab.* ?
7. Apolectus immunis, *Benn. Proc. Comm. Zool. Soc.* i. 1831, p. 146; Apodontis immunis, *Benn. l. c.* p. 169.—West coast of Africa.

3. Cybium interruptum.

Cuv. & Val. viii. p. 172.

D. 16 | $\frac{1}{17}$ | IX. A. $\frac{1}{17}$ | IX.

Teeth rather conical; lateral line nearly straight, slightly waving on the posterior third of the tail. The length of the head is one-sixth of the total. On each side are three bands, formed by oblong longitudinal spots. (*Cuv.*)

Coast of Pondicherry.

4. Cybium guttatum.

Valent. iii. f. 105.
Scomber guttatus, *Bl. Schn.* p. 23. tab. 5.
Russell, ii. p. 26. pl. 134.
Scomber leopardus, *Shaw, Zool.* iv. p. 591.
Cybium guttatum, *Cuv. & Val.* viii. p. 173; *Richards. Ichth. Chin.* p. 268; *Cant. Catal.* p. 111; *Bleeker, Verh. Bat. Genootsch.* xxiv. *Makr.* p. 38.
—— kuhlii, *Cuv. & Val.* viii. p. 178 (young).

D. 16 | 19–20 | VIII–X. A. 21–22 | VII–VIII.

The teeth are triangular and compressed. The height of the body is five times in the total length, and nearly equals the length of the head. Above blue, beneath silvery; back and sides with numerous round blackish spots; immature specimens sometimes uniform. The first dorsal black.

East Indian Seas.

a. Adult. China.
b, c. Half-grown. China.
d. Half-grown. China. Presented by J. R. Reeves, Esq.
e–g. Half-grown. China.
h, i. Young. China.
k. Young. China. Presented by Captain Sir E. Belcher, C.B.
l, m. Half-grown. India. Presented by G. R. Waterhouse, Esq., as *Pelamys atripinnis*.
n. Half-grown. India. Presented by General Hardwicke.
o–q. Adult and half-grown: skins. Malayan Peninsula. From Dr. Cantor's Collection.

5. Cybium niphonium.

Cuv. & Val. viii. p. 180; *Faun. Japon. Poiss.* p. 101. pl. 53. f. 2.

D. 20 | 16 | VIII. A. 14 | VIII.

The teeth are triangular and compressed. The height of the body is $5\frac{1}{2}$ in the total length, the length of the head five times. Bluish: sides of the back with numerous rounded or oblong spots; fins blackish.

Sea of Japan.

Perhaps identical with *C. guttatum*.

6. Cybium croockewitii.

Bleeker, Natuurk. Tydschr. Nederl. Ind. 1850, i. p. 161, and *Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 37.

$$\text{D. } 15 \left| \frac{?}{17} \right| \text{VII.} \quad \text{A. } \frac{2}{18} \Big| \text{VII.}^{*}$$

The height of the body is six times in the total length, the length of the head $6\frac{1}{3}$. The posterior part of the lateral line with an elevated keel; tail entirely scaly. A broad blackish band from the dorsal to the anal; the spinous dorsal entirely black. (*Bl.*)

Sea of Banka.

7. Cybium tritor.

Cuv. & Val. viii. p. 176. pl. 218.

$$\text{D. } 15 \left| \frac{3}{13\text{–}14} \right| \text{IX–X.} \quad \text{A. } \frac{3}{13\text{–}14} \Big| \text{IX–X.}$$

Teeth triangular, strongly compressed. The height of the body equals the length of the head, and is $5\frac{1}{2}$ in the total. The lateral line is straight to the vertical from the end of the first dorsal, and then descends in a slightly oblique line. Above bluish, beneath silvery; sides with rather indistinct rounded or oblong dark spots. The first dorsal blackish. (*Cuv.*)

West coast of Africa.

8. Cybium maculatum.

Scomber maculatus, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 426. pl. 6. f. 8.

Cybium maculatum, *Agass. in Spix, Pisc. Brasil.* p. 103. tab. 60; *Cuv. & Val.* viii. p. 181; *Storer, Bost. Journ.* iv. p. 179; *Dekay, New York Fauna, Fishes*, p. 108. pl. 73. f. 232; *Holbr. Ichthyol. S. Carol.* p. 66. pl. 9. f. 1.

$$\text{D. } 17 \left| \frac{2}{15} \right| \text{IX.} \quad \text{A. } \frac{2}{15} \Big| \text{IX.} \quad [\text{Vert. } 45.]$$

The teeth are rather conical. The lateral line is nearly straight, slightly bent downwards beneath the second dorsal. The length of the head is $5\frac{2}{3}$ in the total. Sides with rounded blackish spots, irregularly arranged. The anterior portion of the first dorsal black.

Atlantic coasts of North America.

9. Cybium regale.

? *Sloane, Jamaica*, ii. p. 284 (Scomber linea et maculis luteis).

Corororoca, *Marcgr.* p. 179.

Scomber regalis, *Bloch*, taf. 333; *Bl. Schn.* p. 22; *Lacép.* iv. p. 711, v. p. 789.

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* The frequent typographical errors in Dr. Bleeker's papers are sometimes very annoying. In this instance, both the accounts quoted give a formula of the fins that is quite impossible in a fish of this genus, viz.:—D. $15 \left| \frac{7}{17} \right|$ VII. A. $\frac{6}{28} \Big|$ VII., and D. $15 \left| \frac{7}{17} \right|$ VII. A. $\frac{6}{18} \Big|$ VII.

Scomberomorus plumieri, *Lacép.* iii. pp. 292, 293.
Cybium regale, *Cuv. & Val.* viii. p. 184.

D. 17 | $\frac{2}{15}$ | VII–VIII. A. $\frac{2}{14}$ | VIII.

Teeth triangular, strongly compressed. The lateral line descends obliquely, and is slightly waving on the tail. Pectoral scaly. A brownish longitudinal band commences from the pectoral, and there are spots of the same colour above and below the band; anterior portion of the dorsal fin black.

Caribbean Sea.

a–e. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
f. Adult: stuffed. Jamaica. Presented by J. Gould, Esq.
g. Adult.

10. Cybium caballa.

Guarupucu, *Marcgr.* p. 178.
Scomber maximus, &c., *Brown, Jam.* p. 452.
Cybium caballa, *Cuv. & Val.* viii. p. 187; *Sagra, Hist. Cuba, Poiss.* p. 103.

D. 14 | $\frac{2}{15}$ | IX. A. $\frac{2}{15}$ | IX.

Teeth triangular, strongly compressed, widely set. The lateral line descends abruptly below the second dorsal. Pectoral scaly at the base only. Sides of the body with indistinct darker spots; the first dorsal blackish above.

Atlantic shores of tropical America.

a, b. Half-grown. S. Domingo. Purchased of Mr. Cuming.
c. Adult: skin. Jamaica. From Dr. Parnell's Collection.

11. Cybium flavo-brunneum.

Smith, Ill. Zool. S. Afr. Fishes, pl. 20.

D. 12 | $\frac{1}{17}$ | V. A. $\frac{2}{13}$ | IV.

Teeth conical, slightly bent inwards, those of the lower jaw three times larger than those of the upper. Scales small, very distinct. The first dorsal low, with feeble spines; pectoral scaly. Uniform brown (in a dried state).

Cape Seas.

a. Adult: stuffed. Cape of Good Hope. From Sir A. Smith's Collection.—Type of the species.

12. Cybium sara.

Benn. in Beechey's Voy. Zool. p. 63. pl. 20. f. 2.

D. 25 | ? | IX. A. ? | IX.

Teeth triangular, strongly compressed, forming a kind of serrature. (*Benn.*)

Near Loo-choo.

6. NAUCRATES.

Naucrates, (*Rafinesque*) *Cuv. Règne Anim.*; *Cuv. & Val.* viii. p. 312.

Body oblong, subcylindrical, covered with small scales; cleft of the mouth moderate; a keel on each side of the tail; the spinous dorsal reduced to a few free spines; spurious fins none; ventrals thoracic. Villiform teeth in the jaws, on the vomer and the palatine bones. Branchiostegals seven; air-bladder present, small. Pyloric appendages in moderate number.

All the seas of the temperate and tropical regions.

1. Naucrates ductor.

The Pilot.

Πόμπιλος, *Ælian.* ii. c. 15, xv. c. 23; *Athen.* vii. 282; *Oppian.* i. p. 188.

Pompilus, *Ovid. Hal.* v. 101; *Plin.* ix. c. 15, xxxii. c. 11; *Gesner*, p. 881; *Aldrov.* iii. c. 19. p. 325; *Willughby*, p. 215, *App.* pl. 8. f. 2; *Ray*, p. 101 (not *Rondel.*).

Pilote, *Dutertre, Hist. Antilles*, ii. p. 223.

Coryphæna, no. 3, *Artedi, Genera*, p. 16.

Gasterosteus ductor, *L. Syst. Nat.* i. p. 489; *Brünn. Pisc. Mass.* p. 67; *Bennett, Whaling Voyage*, ii. p. 274.

Scomber, sp., *Gronor. Zoophyl.* no. 309; *Koelreuter, Nov. Comm. Petrop.* ix. p. 464. t. 10. f. 4, 5.

Gasterosteus antecessor, *Daldorf, Skrivt. Nat. Selsk. Kjobenh.* ii. p. 163.

Duhamel, Pêches, ii. sect. 4. pl. 4. f. 4, pl. 9. f. 3.

Scomber ductor, *Bl.* t. 338; *Bl. Schn.* p. 32; *Hasselq. Iter*, p. 336; *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 424.

—— koelreuteri, *Bl. Schn.* p. 570.

Centronotus conductor, *Lacép.* iii. p. 311; *Risso, Ichth. Nice*, p. 428, and *Eur. Mérid.* iii. p. 193; *Couch, Linn. Trans.* xiv. p. 82.

Naucrates ductor, *Cuv. & Val.* viii. p. 312. pl. 232; *Yarrell, Brit. Fishes*, i. p. 170; *Guichen. Explor. Algér. Poiss.* p. 60.

—— noveboracensis, *Cuv. & Val.* viii. p. 325.

—— indicus, *Cuv. & Val.* viii. p. 326; *Cuv. Règne Anim. Ill. Poiss.* pl. 54. f. 1; *Less. Voy. Coq. Zool. Poiss.* p. 157. pl. 14; *Richardson, Ichth. Chin.* p. 269.

—— koelreuteri, *Cuv. & Val.* viii. p. 327.

Thynnus pompilus, *Gronov. Syst. ed. Gray*, p. 123.

D. $3\text{–}6 \mid \frac{1}{26\text{–}28}$. A. $\frac{2}{16\text{–}17}$. Cæc. pylor. 12–15. Vert. 10/16.

Bluish, with five to seven dark vertical bars.

Nearly all the seas of the temperate and tropical regions.

a. Adult: stuffed. Polperro.
b. Adult: stuffed. Falmouth. Presented by W. C. Cocks, Esq.
c. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.
d. Half-grown: stuffed: not good state. Cape Seas. From Sir A. Smith's Collection.
e. Young. South Pacific. Voyage of the 'Herald.'
f. Half-grown. N.W. coast of America. Presented by Lieut. Wood.
g. Adult. Presented by I. Inglis, Esq.
h. Adult. From the Haslar Collection.
i. Adult.

k. Adult.
l. Adult.
m. Adult: skin. From Mr. Yarrell's Collection.
n, *o*. Half-grown: not good state.
p. Half-grown: skin. From Gronow's Collection.
q. Adult female: skeleton. Madeira. From the Haslar Collection.

7. ELACATE.

Elacate, *Cuv. Règne Anim.*; *Cuv. & Val.* viii. p. 328.

Body fusiform, covered with very small scales; head depressed; cleft of the mouth moderately wide; no keel on the tail; the spinous dorsal formed by eight free and small spines; spurious fins none; ventrals thoracic. Villiform teeth in the jaws, on the vomer and the palatine bones. Branchiostegals seven; air-bladder none. Pyloric appendages dendritical.

Indian Seas. Tropical parts of the Atlantic; Atlantic shores of the United States.

1. Elacate nigra.

Gasterosteus canadus, *L. Syst. Nat.* p. 491.
Marcgr. p. 158.
Scomber niger, *Bl.* tab. 337; *Bl. Schn.* p. 35.
Centronotus gardenii, *Lacép.* iii. p. 357.
—— spinosus, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 490. pl. 3. f. 9.
Pedda-mottah, *Russell*, ii. p. 39. pl. 153.
Elacate pondiceriana, *Cuv. & Val.* viii. p. 329; *Rüpp. N. W. Fische*, p. 43. taf. 12. f. 3.
—— motta, *Cuv. & Val.* viii. p. 332; *Bleeker, Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 42.
—— malabarica, *Cuv. & Val.* viii. p. 332; *Cuv. Règne Anim. Ill. Poiss.* pl. 54. f. 2.
—— atlantica, *Cuv. & Val.* viii. p. 334. pl. 233; *Dekay, New York Fauna, Fishes*, p. 113. pl. 25. f. 77.
—— bivittata, *Cuv. & Val.* viii. p. 338; *Faun. Japon. Poiss.* p. 104. pl. 56; *Richards. Ichth. Chin.* p. 269; *Cantor, Catal.* p. 116.
—— canada, *Holbr. Ichth. S. Carol.* p. 95. pl. 14. f. 1.
? Elacate falcipinnis, *Gosse, Jamaica*, p. 208.
Thynnus canadensis, *Gronov. Syst. ed. Gray*, p. 122.

D. 8 | 28–35. A. 25–27. Vert. 12/13.

The height of the body is one-eighth of the total length; caudal obliquely truncated, with the upper lobe longest. Back and the upper half of the sides brownish- or bluish-black, with a light longitudinal band from above the orbit to the root of the caudal.

Indian Seas. Tropical parts of the Atlantic, extending along the shores of the United States.

a. Fine specimen. New Orleans. Purchased of Mr. Cuming.
b. Adult: skin. Jamaica. From Dr. Parnell's Collection.
c, *d*. Half-grown: skins. Malayan Peninsula. From Dr. Cantor's Collection.
e. Adult: not good state. Japan. Purchased of Mr. Frank.

f. Half-grown. Sea of Pinang. From Dr. Cantor's Collection.
g. Adult: skin. From Gronow's Collection.
h. Two feet long: stuffed.
i. Three feet long: stuffed. From the Collection of the Zoological Society.
k. Half-grown: stuffed.

8. ECHENEIS.

Echeneis, *Artedi, Genera*, p. 14.

Body fusiform, covered with very small scales; head depressed; the spinous dorsal modified into an adhesive disk, situated on the head and neck; cleft of the mouth moderately wide; no keel on the tail; spurious fins none; ventrals thoracic. Villiform teeth in the jaws, on the vomer, the palatine bones, and generally on the tongue. Branchiostegals seven; air-bladder none. Pyloric appendages in moderate number.

Inhabitants of nearly all the seas.

1. Echeneis clypeata.

? *Dampier, Voy. New Holland*, i. pl. 1. f. 6.
Echeneis clypeata, *Günth. Ann. & Mag. Nat. Hist.* May 1860, p. 401.

D. 12 | 17. A. 20.

The length of the disk is $3\frac{1}{7}$ in the total, the width of the body between the pectorals five times. Caudal subtruncated; the lower jaw and the vomer anteriorly with a series of widely-set and stronger teeth. The angle of the mouth is situated in the vertical from the second lamina; the length of the ventral is much less than the distance between the root of the pectoral and the posterior margin of the eye. Uniform brown.

Cape Seas.

a. Cape Seas. From Sir A. Smith's Collection.
b. Stuffed. Cape Seas. From Sir A. Smith's Collection.

Description.—This species is closely allied to *E. albescens*, from which it not only differs in having a smaller number of laminæ (which I do not think very important), but also a shorter mouth and a shorter ventral fin. The disk is elliptical, rather broader posteriorly than anteriorly, and $1\frac{1}{2}$ as long as broad; its length is $3\frac{1}{7}$ in the total, and it extends not quite so far backwards as the pectoral; the membranaceous margin is rather broad and depressed. The mouth is broad and truncated; its cleft extends laterally to the vertical from the posterior nostril, or from the second lamina of the disk. The jaws, the vomer, the palatine bones, and the tongue are armed with bands of villiform teeth; the lower jaw and the vomer have, besides, an outer series of stronger teeth, which are rather widely set. The eye is small.

The length of the head is $4\frac{2}{5}$ in the total, the width of the body between the pectorals five times. The back behind the head is very broad, gradually becoming shorter posteriorly; the body itself is short, stout, and covered with minute scales.

The pectoral is rounded, scaly; its length is one-seventh of the total. The ventral is very short, only one-eleventh of the total length, rounded posteriorly, inserted below the root of the pectoral, and composed of one spine and five soft rays. The soft dorsal and anal are opposite to each other, the latter being slightly the longer, and placed very far backwards; the distance between the soft dorsal and the disk nearly equals the length of the latter. The caudal is subtruncated, with the angles rounded.

Although the specimens on which this species and *E. albescens* have been founded, have a form of the caudal fin which is usually observed in adult specimens of this genus, or in those approaching the mature state, it would appear, from the notes of Dampier, that they grow to a much larger size. The figure quoted has undoubtedly been taken from *E. albescens* or *E. clypeata*, as is proved by the form of the disk and the backward position of the soft dorsal and anal fins; but he says (*Voyage round the World*, i. p. 64) that the "excrescence on the head is about 7 or 8 inches long and 5 or 6 broad, and rising about ½ an inch high."

	inches.	lines.
Total length	5	6
Length of the head	1	3
Width of the body between the pectorals ..	1	1½
Length of the disk....................	1	9
Width of the disk	1	1
Diameter of the eye	0	1½
Distance between the disk and the soft dorsal	1	0
Length of the pectoral	0	9
——— of the ventral	0	5½

2. Echeneis albescens.

Temm. & Schleg. Faun. Japon. Poiss. p. 272. pl. 120. f. 3.

D. 13 | 22. A. 22.

The length of the disk is 3¼ in the total, the width of the body between the pectorals 5½. Caudal subtruncated; mouth obtuse; the lower jaw and the vomer anteriorly with a series of widely-set, stronger teeth. The angle of the mouth is situated in the vertical from the third lamina; the length of the ventral equals the distance between the root of the pectoral and the posterior margin of the eye. Uniform greyish-brown.

Seas of China and Japan.

a. Six inches long. China. Presented by Sir J. Richardson.

3. Echeneis squalipeta.

Daldorf in Skrivt. af Naturhist. Selskab. ii. p. 157; *Bl. Schn.* p. 240.

Disk with seventeen laminæ, extending nearly to the middle of the back; the height of the body is about one-fourth of the total length; tongue rough; the anal and dorsal fins continued to the caudal. Colour greyish-brown. (*Dald.*)

Atlantic, between the tropics.

4. Echeneis brachyptera.

Remora, *Catesby, Hist. Natur. South Carol.* ii. p. 26. pl. 26.
Echeneis ——?, *Lowe, Trans. Zool. Soc.* ii. p. 191.
—— brachyptera, *Lowe, Proc. Zool. Soc.* 1839, p. 89, and *Trans. Zool. Soc.* p. 17; *Günth. Ann. & Mag. Nat. Hist.* May 1860, p. 399.
—— sexdecim-lamellata, *Eydoux et Gervais, Voy. de la Favorite,* v. *Zool.* p. 77. pl. 31.
? Echeneis quatuordecim-lamellatus, *Storer, Report Fishes Massach.* p. 155.
Echeneis pallida, *Temm. & Schleg. Faun. Japon. Poiss.* p. 271. pl. 120. f. 2, 3.
—— nieuhofii, *Bleek. Sumatra,* ii. p. 279.

D. (14) 15–16 (17) | 29–32. A. 25–27 (–30).

The length of the disk is $3\frac{3}{4}$ to 4 times in the total, the width of the body between the pectorals $6\frac{2}{3}$ to 7 times. Caudal truncated. The upper jaw angular, both intermaxillaries forming a rather obtuse angle together. Coloration uniform.

Sea of Madeira; coasts of North America and of Brazil; Japanese and Chinese Seas; Sea of Sumatra.

a. Adult, with sixteen laminæ. China. From the Haslar Collection.
b, c. Half-grown, with fifteen laminæ. Brazil. Presented by J. P. G. Smith, Esq.

5. Echeneis remora.

Echeneis, *Ovid. Halieut.* v. 99; *Plin.* xxxii. cap. 1, ix. cap. 25; *Ælian.* i. cap. 36, ii. cap. 17; *Wotton, De Differ.* p. 149.
'Εχενηΐς, *Plutarch, Sympos.* lib. ii.; *Oppian. Halieut.* i. p. 9.
Remora, *Rondel.* xv. c. 18. p. 436; *Petiver, Gazophyl.* tab. 44. f. 12.
Zuiger, *Nieuhoff, Bras. Zee- en Lant-Reize,* ii. p. 274. f. 67.
Remora imperati, *Willughby, Appendix,* p. 5. tab. 9. f. 2.
Sucking-fish, *Edwards, Gleanings,* no. 210; *Penn. Brit. Zool.* edit. 4. vol. iii. *App.* p. 524.
Echeneis remora, *L. Syst.* i. p. 446, and *Amœn. Acad.* i. p. 320, and *Mus. Reg. Ad. Fred.* i. p. 75; *Osbeck, Voy. China,* p. 94; *Schoepff, Schrift. Gesellsch. Naturf. Freunde Berlin,* viii. 3. p. 145; *Bl.* ii. p. 134. pl. 172; *Bl. Schn.* p. 240; *Lacép.* iii. pp. 146, 147. pl. 9. f. 1; *Cuv. Règne Anim.*; *Blumenb. Abbild.* taf. 78; *Risso, Ichth. Nice,* p. 177, and *Eur. Mérid.* iii. p. 269; *Shaw, Zool.* iv. p. 202. pl. 31; *Müller, Prodr. Faun. Dan.* no. 361; *Mitch. Trans. Lit. & Phil. Soc. New York,* i. p. 378; *Turton, Brit. Faun.* p. 94; *Richards. Faun. Bor. Amer.* p. 265; *Faber, Fische Islands,* p. 115; *Schleg. Faun. Japon. Poiss.* p. 271; *Dekay, New York Fauna, Fishes,* p. 309; *Lowe in Trans. Zool. Soc.* iii. p. 16; *Benn. Whaling Voy.* p. 271; *Jenyns, Zool. Beagle, Fishes,* p. 142; *Yarrell, Brit. Fishes,* 3rd edit. i. p. 670; *Günth. Ann. & Mag. Nat. Hist.* May 1860, p. 390.
Echeneis, sp., *Klein, Miss.* iv. p. 51. no. 1; *Gronov. Zoophyl.* p. 75. no. 256, and *Mus. Ichthyol.* i. no. 33.

Styris-fiskr, *Olafs. Reise durch Island*, ii. p. 207.
Duhamel, Pêches, ii. sect. 4. p. 56. pl. 4. f. 5.
Echeneis naucrates, *Risso, Eur. Mérid.* iii. p. 270.
—— jacobæa, *Lowe, Proc. Zool. Soc.* 1839, p. 89, and *Trans. Zool. Soc.* iii. p. 17.
—— pallida, *Lowe, l. c.*, and *Trans. Zool. Soc.* iii. p. 16 (not *Schleg.*).
—— remoroides, *Bleek. Batoe*, ii. p. 70.
—— parva, *Gronov. Syst. ed. Gray*, p. 92.
Skeleton: *Rosenth. Ichthyot. Tafeln.* t. 20. f. 1–8.

D. 17–18 (19) | 22–24. A. 25. Cæc. pylor. 6. Vert. 12/15.

The length of the disk is $3\frac{1}{6}$ in the total, the width of the body between the pectorals $5\frac{1}{2}$. Caudal subcrescentic; dorsal and anal fins not continued to the caudal. Mouth rounded. Colour brown.

Seas of the temperate and tropical regions.

a. Half-grown. Guernsey. Presented by Mrs. Mauger.
b, c. Young. Madeira. Purchased of Mr. Stevens.
d–h. Young. Cape of Good Hope.
i. Adult: stuffed. Cape of Good Hope. Presented by Sir A. Smith.
k. Adult. India. Presented by W. Masters, Esq.
l, m. Young. India. Presented by W. Masters, Esq.
n. Adult. India. Purchased of M. Parzudaki.
o. Adult. India.
p. Young. India.
q. Half-grown. India. From the Collection of the East India Company.
r. Half-grown. India. From the Collection of the East India Company.
s. Half-grown. China Seas. Presented by Capt. Sir E. Belcher, C.B.
t. Adult: not good state. N.W. coast of America. Presented by Lieut. Wood.
u, v. Young. South Sea.
w. Young. South Sea. Museum Leach.
x. Young: not good state. Port Essington. From the Haslar Collection.
y. Young. Bass's Straits. Presented by Sir J. Richardson.
z, α. Adult. From the Haslar Collection.
β. Large specimen. From the Collection of the Zoological Society.
γ. Large specimen. From the Haslar Collection.
δ. Adult: skeleton. From the Haslar Collection.
ε. Large specimen.
ζ, η. Adult and half-grown.
θ, ι. Half-grown and young. From the Collection of the Zoological Society.
κ. Half-grown. From the Collection of the Zoological Society.
λ. Half-grown. Purchased of Mr. Stevens.
μ. Half-grown.
ν, ξ. Half-grown.
ο–ς. Half-grown.
τ–φ. Half-grown. Presented by J. B. Jukes, Esq
χ. Half-grown. From the Collection of the East India Company

ψ. Half-grown. From the Haslar Collection.
ω. Half-grown. From the Haslar Collection.
aa. Half-grown. Presented by Lord Orkney.
bb–ff. Half-grown and young.
gg–ii. Half-grown and young.
kk. Half-grown. Purchased of Mr. Stevens.
ll. Half-grown. Presented by Mrs. Mauger.
mm. Half-grown. Presented by the Royal College of Surgeons.
nn. Half-grown.
oo, pp. Half-grown.
qq. Young. From the Collection of the Zoological Society.
rr. Young.
ss. Young.
tt, uu. Young.
vv–xx. Young.
yy. Young.
zz. Young. Presented by the Royal College of Surgeons.

Skeleton.—The structure of the skeleton is distinguished by several peculiarities. The upper part of the skull is very broad, flat, excavated for the reception of the adhesive disk. The occipital is rounded, without any crest; the parietals are very small, and united with the principal frontal bones; the latter are provided with a low, depressed, longitudinal crest, and extend nearly to the anterior extremity of the snout; the ethmoid is large, free, ovate, and situated between the anterior part of the frontals. The præfrontals are rather small, forming the anterior portion of the roof of the orbit; there is a roundish opening between the præfrontal and the principal frontal. The maxillary is much more slender than the intermaxillary, and placed immediately before and below the turbinal bones; the latter are singularly elongate, and form the outer margin of the snout: both are far remote from each other, converging anteriorly. The vomer is exceedingly broad, with a shallow impression along its middle. The dentary and articulary portions of the mandibula are loosely joined together—the former extending far backwards, the latter reaching nearly to the anterior extremity of the jaw; the angular portion is small; the muciferous channel is rudimentary. The præorbital is triangular and very solid, the remainder of the infraorbital ring slender.

The præoperculum is small, and has the margin rounded, and a very prominent and strong ridge along its inferior portion. The operculum is rhombic, small, with two strong, not very prominent ridges, radiating from its upper angle. The suboperculum is crescent-shaped, bent upwards behind the operculum; the interoperculum is small. The suprascapula is broad, forming a part of the upper surface of the skull; it is joined to the ridge of the frontal bone by a slender horizontal process: the scapula is small and short. The humeral is composed of two lamellæ, forming together a deep groove: the coracoid appears to be absent. The pubic bones are broad, each formed by a single bony plate, which is convex inferiorly, and provided with three low ridges; they are attached to the middle of the humerus by a short process; another pair of processes are directed forwards towards the symphysis of the humeral bones, to which, however, they do not extend.

There are twelve abdominal and fifteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·35. The vertebræ are rather slender and elongate; the neural spines short, and depressed backwards. The parapophyses of the abdominal vertebræ are remarkably strong and long, and, at the extremity of each, a rib and epipleural spine are suspended;—even the caudal vertebræ are provided with epipleurals. The structure of the buckler is known, and it need only be mentioned that each pair of the lamellæ (dorsal spines) has a corresponding interneural.

6. **Echeneis osteochir.**

Cuv. Règne Anim., and *edit. Ill. Poiss.* pl. 108. fig. 3 (bad).

Disk with nineteen laminæ. The rays of the pectoral compressed and ossified. (*Cuv.*)

Hab. —— ?

7. **Echeneis scutata.**

Günth. Ann. & Mag. Nat. Hist. May 1860, p. 401. pl. 10. f. B.

D. 27 | 22. A. 21–23.

The length of the disk is $2\frac{1}{3}$ in the total, the width of the body between the pectorals $5\frac{3}{5}$. Caudal truncated; dorsal and anal fins not continued to the caudal. Colour brown.

Indian Ocean.

a. Large specimen: stuffed. Ceylon. From Dr. Sibbald's Collection.
b. Half-grown. India. Presented by G. R. Waterhouse, Esq.

Description.—This species has the general habit of *E. remora*, but may be readily distinguished from all the others by the extraordinary size of the disk, which is elongate, subelliptical, obtusely rounded anteriorly and posteriorly, and formed by twenty-seven pairs of laminæ; it extends backwards beyond the vertical from the tip of the ventrals, and its length is $2\frac{1}{3}$ in the total. The spines with which the single laminæ are armed are less conspicuous than in the other species, and do not offer the same resistance to the touch. There is a large posterior portion of the disk which is not provided with laminæ, but quite smooth. The width of the disk, taken between the extremities of the bony laminæ, is one-third of its length; the membranaceous margin is bent upwards.

The head and the body below the disk are depressed, and their height is $9\frac{1}{2}$ in the total length, whilst the width between the pectorals is $5\frac{3}{5}$ in it. The body between the disk and the vertical fins is quadrangular, tapering posteriorly. The upper jaw is subtruncated, and overreached by the lower, which is much narrower; both are armed with a broad band of villiform teeth, and with an outer series of larger ones on the sides; the vomerine and palatine bones have a continuous band of teeth, narrowest on the vomer: the tongue is hard, cartilaginous, and destitute of teeth.

The cleft of the mouth reaches only to the vertical from the nostril; the eye is small.

The pectoral is rounded and small, its length being one-ninth of the total: the ventrals are slightly pointed, and, as in all the species of the genus, composed of one spine, hidden in the skin, and four soft rays; they are inserted immediately behind the vertical from the pectoral, which they equal in length; they can be received in a shallow groove on the abdomen. The distance between the dorsal and the disk is 3½ in the length of the latter; the dorsal is low, and enveloped in a thick membrane. The caudal is truncated when stretched out. The anal is very similar to the dorsal, and its origin and termination fall vertically below those of the latter.

The scales are minute, and can be perceived only by the aid of a magnifier; they are imbedded in pore-like cavities.

	inches.	lines.
Total length of the larger specimen	23	0
Total length of the smaller specimen	7	11
Height of the body	0	10
Width between the pectorals	1	5
Length of the head	2	0
——— of the disk	3	5
Breadth of the disk	1	2
Length of the pectoral and ventral	0	10½
Diameter of the eye	0	2⅔

8. Echeneis lineata.

Echeneis lineata, *Menzies, Trans. Linn. Soc.* i. 1791, p. 187. tab. 17. f. 1; *Bl. Schn.* p. 240. tab. 53. f. 1; *Lacép.* iii. pp. 146, 167; *Shaw, Zool.* iv. p. 211; *Günth. Ann. & Mag. Nat. Hist.* May 1860, p. 398.
—— tropica, *Euphrasen, Nya Handl.* xii. 1791, p. 317.

D. 10 | 33. A. 33.

Body rather slender. Two whitish streaks along each side.
Atlantic and Pacific, between the tropics.

9. Echeneis holbrookii.

Echeneis albicauda, pt., *Dekay, New York Fauna, Fishes,* p. 307 (not *Mitch.*).
? Echeneis naucrates, *Guichen. Explor. Algér. Poiss.* p. 111.
Echeneis lineata, *Holbr. Ichth. S. Carol.* p. 101. pl. 14. f. 2 (not *Menz.*).
—— holbrookii, *Günth. Ann. & Mag. Nat. Hist.* May 1860, p. 400.

D. 21 | 35. A. 33.

The length of the disk is 3⅘ in the total, or twice the width of the body between the pectorals. Mouth rounded, the lower jaw terminating in a slightly pointed flap. Brown: generally a black band, edged with whitish, from the snout, through the eye, along the side of the body and the tail.

Atlantic.

a. Twelve inches long. Jamaica. From the Collection of the Zoological Society.

b, c. Twelve inches long: skins. Jamaica. From Dr. Parnell's Collection.

Description.—This species is very similar to *E. naucrates*, with which it may be easily confounded. The chief difference is in the disk, which, although composed of fewer laminæ, is relatively longer when compared with the entire length of the fish. In the specimens which have come under my observation, and also in those which have served for Holbrook's description, the number of laminæ has been constantly found to be twenty-one—a number of very rare occurrence in *E. naucrates*. The disk is an elongate ovoid, broader posteriorly than anteriorly, with the membranaceous margin depressed. The mouth is rounded and much depressed, the lower jaw terminating in a soft and slightly pointed flap. The fold in which the maxillary bone is received, reaches to the vertical drawn from the space between the nostrils and the eye. The jaws, the vomer and palatine bones and the tongue are armed with broad bands of villiform teeth; the vomer, besides, has an anterior transverse series of rather stronger teeth.

The length of the head is $5\frac{1}{3}$ in the total, the width of the body between the pectorals one-eighth. The body tapers posteriorly, and the posterior part of the tail is rather slender and cylindrical. The whole body is covered with minute scales.

The pectoral is subtriangular, slightly pointed, one-eighth of the total length: the ventral is inserted in the vertical from the posterior part of the root of the pectoral; it is composed of five rays and one spine, hidden below the skin; its length is one-tenth of the total. The soft dorsal begins at a distance from the disk which is rather more than the length of the head, and terminates shortly before the caudal. The origin and the termination of the anal correspond to those of the opposite fin. The caudal is truncated, or very slightly convex, in specimens 1 foot in length.

In specimens of this age—and they are apparently not yet mature—the dorsal and caudal fins have a narrow, the caudal a broad upper and lower white margin.

	inches.	lines.
Total length	12	0
Length of the head	2	3
Width between the base of the pectorals	1	6
Length of the disk	3	2
Greatest width of the disk	1	$1\frac{1}{2}$
Distance between the soft dorsal and the disk	2	5
Diameter of the eye	0	5
Length of the pectoral	1	6
——— of the ventral	1	2

10. Echeneis naucrates.

Echeneis s. Remora, *Aldrorandi*, iii. cap. 22. p. 335; *Jonston, Thaumatogr.* i. tit. 1. cap. 2. art. 4. tab. 4. f. 3, tab. 39. f. 8; *Marcgr. Iter Bras.* p. 180; ? *Gottorff. Kunstkammer*, tab. 25. f. 2; *Willughby*, p. 119. tab. G. 8. f. 2; *Ray, Syn.* p. 71; *Ruysch, Theatr. Univ.* p. 7. tab. 4. f. 3, tab. 39. f. 8; *Seba*, iii. p. 103. tab. 33. f. 2; *Dutertre, Hist. Gén. des Antilles*, ii. p. 299. fig. opp. p. 222; *Brown, Hist. Jamaica*, p. 443.

—— naucrates, *L. Syst.* i. p. 446; *Hasselq. Iter Palest.* p. 324 (German edit. p. 371); *Schoepff, Schrift. Gesellsch. Naturf. Freunde Berlin*, viii. 3. p. 145; *Bl.* ii. p. 131. tab. 171; *Bl. Schn.* p. 239; *Lacép.* iii. pp. 146, 162. pl. 9. f. 2; *Shaw, Zool.* iv. p. 209. pl. 31; *Cuv. Règne Anim.*; *Storer, Rep. Fishes Massach.* p. 153; *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 377; *Richards. Faun. Bor. Amer.* iii. p. 266, and *Ann. & Mag. Nat. Hist.* xi. 1843, p. 498; *Cantor, Catal.* p. 199; *Faun. Japon. Poiss.* p. 270. pl. 120. f. 1; *Richards. Ichthyol. China*, p. 203[*]; *Guichen. Explor. Algér. Poiss.* p. 111; *Webb & Berthel. Iles Canar. Poiss.* p. 87; *Günth. Ann. & Mag. Nat. Hist.* May 1860, p. 395.

——, sp., *Gronov. Zoophyl.* p. 75. no. 252, and *Mus. Ichthyol.* i. p. 13. no. 34; *Klein, Miss. Pisc.* iv. p. 51. no. 2.

Pegador, *Parra*, p. 94. pl. 36. f. 2 (not good).

Ala Mottah, *Russell*, i. p. 39. pl. 49.

Echeneis albicauda, *Mitch. Am. Month. Mag.* ii. p. 244.

—— lunata, *Bancroft, Proc. Comm. Zool. Soc.* i. p. 134, and *Zool. Journ.* v. p. 411. pl. 18 (not good).

—— australis, *Griff. Anim. Kingd. Pisc.* pl. opp. p. 504; *Bennett, Whaling Voyage*, ii. p. 273.

—— vittata, *Lowe, Proc. Zool. Soc.* 1839, p. 89, 1850, p. 252, and *Trans. Zool. Soc.* iii. p. 17.

—— vittata, *Rüpp. N. W. Fische*, p. 82.

—— albicauda, pt., *Dekay, New York Faun. Fishes*, p. 307. pl. 54. f. 177.

—— fusca, *Gronov. Syst. ed. Gray*, p. 92.

Skeleton: *Agass. Recherches Poiss. Foss.* iv. tab. G.

D. (21) 22–25 (26) | 33–41. A. 32–38. Vert. 14/16.

The length of the disk is $4\frac{1}{2}$–$4\frac{3}{5}$ in the total, or twice the width of the body between the pectorals. Caudal subcrescentic in mature, more or less convex in immature, and with the middle portion exceedingly produced in young specimens. Mouth rounded, with the lower jaw pointed. Brown: generally a blackish band, edged with whitish, from the snout, through the eye, along the side of the body and the tail. Sometimes uniform, sometimes irregular blotches instead of the band.

Seas of the temperate and tropical regions.

I. Suctorial disk with twenty-one pairs of laminæ.

a. Eight inches long. North coast of Australia. Antarctic Expedition.—The middle portion of the caudal considerably produced.

II. Suctorial disk with twenty-two or twenty-three laminæ.

b. Fine specimen: skeleton. Madeira. Presented by J. G. Johnson, Esq.

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[*] One of the most valuable observations of Sir J. Richardson.

c. Half-grown: stuffed. West Indies. Purchased of Mr. Scrivener.
d. Twenty-five inches long: skin. Jamaica. From Dr. Parnell's Collection.
e. Half-grown. Texas. Purchased of Mr. Brandt.
f. Adult. Bahia.
g. Adult: bad state. Seychelles. From the Haslar Collection.
h. Half-grown: skin. Sea of Pinang. From Dr. Cantor's Collection.
i. Young. China Seas. Presented by Captain Sir E. Belcher, C.B.
k. Adult: stuffed. India. From the Collection of the East India Company.
l. Young. Australia. From Mr. Dring's Collection.
m. Thirty-two inches long: stuffed. From the Collection of the Zoological Society.
n. Large specimen. Presented by Lieut. Strickland.
o. Large specimen. From the Collection of the Zoological Society.
p. Half-grown: stuffed. From the Collection of the East India Company.
q–s. Half-grown and young. Old Collection.
t. Half-grown. Presented by J. B. Jukes, Esq.
u. Half-grown: skin. From Gronow's Collection.

III. Suctorial disk with twenty-four laminæ.

v, w. Half-grown. Tenasserim. Presented by Dr. Packman.
x, y. Fine specimens. Amboyna. Purchased of Mr. Frank.
z. Half-grown. China. Presented by J. R. Reeves, Esq.
α. Half-grown. China. Presented by J. R. Reeves, Esq.
β. Half-grown. China. Presented by Sir J. Richardson.
γ. Adult: stuffed. Japan. Purchased of Mr. Frank.
δ. Adult: stuffed. Port Essington. From Mr. Gould's Collection.
ε. Young: bad state. Port Essington. From the Haslar Collection.
ζ. Half-grown. From the Collection of the Zoological Society.
η. Adult: stuffed: bad state. Old Collection.
θ. Adult: stuffed. Purchased of Mr. Argent.
ι. Adult: stuffed. Presented by Dr. J. E. Gray.

IV. Suctorial disk with twenty-five laminæ.

κ. Adult: stuffed. West Indies. Purchased of Mr. Scrivener.
λ, μ. Six inches long. New Guinea. Presented by Mrs. Stanley.—The middle portion of the caudal considerably produced.
ν. Young: skin. Sea of Pinang. From Dr. Cantor's Collection.
ξ. Adult: not good state. South Sea. From the Haslar Collection.
ο. Total length 4 inches: the produced part of the caudal 1½ inch. California. Purchased of Mr. Stevens.

The structure of the skull and of the vertebral column is very similar to that of *E. remora*; the bones are a little more elongate, and the præfrontal forms the entire upper margin of the orbit; the foramen between the præfrontal and principal frontal is small. There are fourteen abdominal and sixteen caudal vertebræ, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·67. The caudal vertebræ are compressed and elongate.

9. HYPSIPTERA.

Body oblong, compressed, apparently naked, but covered with extremely minute scales; snout obtuse; cleft of the mouth of moderate width. Opercles not armed. The first dorsal continuous, with very feeble spines; the second and the anal are much more developed; finlets none; anal spines none; ventrals jugular, composed of three or four thread-like rays. Minute teeth in the jaws. Branchiostegals seven; air-bladder none. Pyloric appendages in small number.

Open sea.

1. Hypsiptera argentea.

B. 7. D. 6–10 | 50. A. 55. V. 3–4.

Silvery; back greyish-green; fins transparent.

a, b. Open sea. Presented by J. B. Godfrey, Esq
c–g. Open sea. Presented by J. B. Godfrey, Esq.

Description.—The discovery of this genus is one of the most interesting additions to our ichthyological knowledge, as, although having an entirely Scomberoid aspect, it deviates from this family in having jugular ventral fins. By this character the fish may be readily recognized, even if the specimens are young and several of the characters mentioned should change with age.

The body is compressed and oblong, its greatest depth, below the spinous dorsal, being contained four times and four-fifths in the total length; the head has the upper surface smooth and flat, and the width of the interorbital space is nearly equal to the diameter of the eye; the length of the head is contained four times and one-third in the total. The snout is rather short, obtuse, rounded, with the upper jaw overlapping the lower. The cleft of the mouth is of moderate width, the maxillary extending slightly beyond the vertical from the centre of the eye. The jaws are armed with minute teeth, but the vomer appears to be toothless. The eye is of moderate size, situated immediately below the upper profile of the head, much nearer to the snout than to the end of the operculum. Belly rounded. The rays of the fins are of an extremely delicate structure, so that it is very difficult to ascertain their number. The spinous dorsal commences immediately behind the vertical from the root of the pectoral, and is composed of six spines in the largest of the specimens, whilst the spines are in greater number, short, and filament-like in the smaller ones. Caudal short, subtruncated. The anal commences behind the origin of the dorsal, and, like the dorsal, it is rather low. The pectorals are of moderate length, and situated high up the sides, on a level with the upper half of the eye. The ventrals, although jugular, are placed laterally, and composed of three long thread-like rays, and there is sometimes a short, inferior fourth. The lateral line is not continued on the tail.

	lines.
Total length	24
Height of the body	5
Length of the head	5½
——— of the ventral fin	6

Second Group. NOMEINA.

Scombridæ with a distinct spinous portion of the dorsal fin, separated from, or continuous with, the soft, which is the more developed. Body oblong, covered with cycloid scales of moderate size.

10. GASTEROCHISMA.

Gasterochisma, *Richards. Ann. & Mag. Nat. Hist.* xv. 1845. p. 346, and *Ichthyol. Voy. Ereb. & Terr.* p. 60.

The body is oblong, compressed, covered with cycloid scales of moderate size; *cleft of the mouth wide.* Lateral line without any armature. The first dorsal with seventeen spines; the second and the anal with the posterior rays detached, forming finlets; no separate anal spines. The ventral is exceedingly long and broad, and *can be completely concealed in a deep fissure on the abdomen.* Teeth conical, small, forming single series in the jaws: teeth on the vomer and the palatine bones.

Coast of New Zealand.

1. Gasterochisma melampus.

Richards. ll. cc. pl. 37. f. 1–3.

(? B. 5.) $\mathrm{D.}\ 17 \left| \frac{1}{10} \right| \mathrm{VI.}\quad \mathrm{A.}\ \frac{2}{10} \Big| \mathrm{VI.}\quad \mathrm{V.}\ 1/5.$

Ventrals black, one-third of the total length. The maxillary reaches somewhat beyond the vertical from the centre of the eye.

New Zealand.

a. Type of the species: bad state. Port Nicholson. From the Haslar Collection.

11. NOMEUS.

Nomeus, *Cuv. Règne Anim.*; *Cuv. & Val.* ix. p. 242.

The body is oblong and rather compressed, covered with cycloid scales of somewhat small size; *cleft of the mouth narrow.* Lateral line without any armature. The first dorsal continuous, with ten or eleven spines; the second and the anal are more developed, and have no detached finlets; no separate anal spines. The ventral is long and broad, attached to the belly by a membrane, *and can be received in a fissure of the abdomen.* Teeth small, forming single series in the jaws; teeth on the vomer and the palatine bones. Pyloric appendages very numerous. Air-bladder present; branchiostegals six.

Tropical parts of the Atlantic; Indian Ocean and Archipelago.

1. Nomeus gronovii.

Gobius, sp., *Gronov. Zoophyl.* p. 82. no. 278.
—— gronovii, *Gm.* p. 1205.
Eleotris mauritii, *Bl. Schn.* p. 66.
Gobiomorus gronovianus, *Lacép.* ii. p. 584.

Nomeus maculosus, *Benn. Proc. Comm. Zool. Soc.* i. 1831, p. 146.
—— mauritii, *Cuv. & Val.* ix. p. 243.
Seriola argyromelas, *Cuv. & Val.* ix. pl. 262.
Nomeus maculatus, *Valenc. in Cuv. Règne Anim. Ill. Poiss.* pl. 56. f. 2.

B. 6. D. 10 | $\frac{1}{26-27}$. A. $\frac{1}{26-27}$. V. 1/5. Vert. 16/25.

The maxillary reaches to below the anterior margin of the eye. The ventrals extend to, the pectorals beyond, the anal fin. The upper parts brown, the brown colour forming several band-like spots on the sides; anal with three brown spots; ventrals black.

Tropical parts of the Atlantic. The species appears to inhabit also the Indian Ocean and the coasts of Australia.

a, b. Adult. South America. Presented by Sir R. Schomburgk.
c. Adult: skeleton. South America. Presented by Sir R. Schomburgk.
d. Half-grown. South Atlantic. From Mr. J. Cranch's Collection.
e–g. Young. Australia. Presented by Captain P. King.
h. Many young specimens. From the Collection of the Zoological Society.—(Probably types of *Nomeus maculosus*, Benn.)
i. Many young specimens. From the Haslar Collection.
k. Half-grown.
l. Many young and half-grown specimens.
m. Adult and young specimens: not in a good state.
n. Young.
o. p. Very young.

There are sixteen abdominal and twenty-five caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·5. The vertebræ are short, with the apophyses feeble. The pubic bones are rather short and narrow.

2. **Nomeus peronii.**

Cuv. & Val. ix. p. 247.

Ventrals white, with two black cross-bands. (*Cuv.*)

Coast of Java.

12. **CUBICEPS.**

Cubiceps, *Lowe, Proc. Zool. Soc.* 1843, p. 82.
Atimostoma, *Smith, Ill. Zool. S. Africa, Fishes.*
Navarchus, *Filippi e Verany in Memor. della Accad. Sc. Torin.* ser. 2. tom. xviii. p. 7 (separate copy).

Body oblong, slightly compressed, with cycloid scales of moderate size; the cleft of the mouth narrow; the snout swollen, obtuse, and short. Præopercular margin entire. The first dorsal continuous, with about ten rather feeble spines; the second and the anal are more developed, scaly, without finlets; no separate anal spines. Pectorals rather elongate, and much longer than the ventrals. Lateral line without any armature. Minute teeth in the jaws, and, in immature specimens, on the palate. Branchiostegals five or six.

Mediterranean; Sea of Madeira; Cape Seas.

This genus is known from three specimens only,—one discovered by the Rev. R. T. Lowe at Madeira, the second by Sir A. Smith at the Cape, and the third by Filippi and Verany in the Mediterranean. There can be no doubt as to their generic identity; and the last-named naturalists have evidently not consulted the works of the English naturalists. But it would appear, from the descriptions quoted, that the specimens belong to different species. If we recollect, however, that the African specimen is an adult fish, half decayed when found, and figured after it had been stuffed, whilst the Madeiran and Mediterranean specimens are apparently young, the latter being rather indifferently figured, we are justified in doubting even their specific difference. In the following descriptions it will be seen in what points the specimens *seem* to differ.

1. Cubiceps capensis.

Atimostoma capense, *Smith, l. c.* pl. 24.

D. 10 | $\frac{1}{19}$. A. $\frac{1}{19}$. L. lat. 66.

The maxillary bone does not extend to the vertical from the margin of the orbit; no furrow on the side of the body. The width of the interocular space equals that of the orbit, which is about one-fourth the length of the head. Coloration uniform.

Cape Seas.

a. Forty-three inches long: stuffed. From Sir A. Smith's Collection—Type of the species.

2. Cubiceps gracilis.

Seriola (Cubiceps) gracilis, *Lowe, l. c.*
Navarchus sulcatus, *Filippi e Verany, l. c.* f. 1.

D. 11 | 20. A. $\frac{3}{20}$. L. lat. 60 (66). L. transv. 9/9.

The maxillary extends to below the anterior part of the orbit. A longitudinal furrow above, and another below the lateral line. Coloration uniform.

Mediterranean; Sea of Madeira.

13. NEPTOMENUS*.

Body oblong, compressed, covered with cycloid scales of moderate size; the cleft of the mouth of moderate width; the snout obtusely conical. Præopercular margin obtusely crenulated. The first dorsal continuous, with seven feeble spines; the second and the anal are more developed, with a scaly sheath at the base; finlets none; anal spines indistinct. Pectorals much longer than the ventrals. A series of minute teeth in the jaws; palate toothless. Branchiostegals six (?)

New Zealand.

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* *νηπτόμενος*, swimming

This genus, founded on a single stuffed specimen, has externally some affinity with *Seriolella*. From the absence of a pair of separate anal spines, however, I infer that it does not agree with the *Carangidæ* in the structure of the vertebral column. The first anal spine is minute, hidden in the skin, and appears to be a little remote from the following one.

1. Neptomenus brama.

D. 7 | $\frac{1}{27}$. A. $\frac{2}{21}$. L. lat. 88. L. transv. 16/25.

Uniform greenish-silvery.
New Zealand.

a. Stuffed. New Zealand. Purchased of J. Gould, Esq.

Description of the specimen.—The body is oblong, somewhat compressed, with the upper and lower profiles slightly curved; the greatest depth of the body is below the origin of the soft dorsal, and is contained $3\frac{1}{4}$ in the total length. The length of the head is $4\frac{1}{2}$ in the total, and its upper side is convex. The snout is rather short, equal in length to the diameter of the eye, obtusely conical, with the jaws nearly equal anteriorly. The maxillary extends to the vertical from the anterior margin of the orbit, and is feeble. The nostrils are nearer to the extremity of the snout than to the orbit, the præorbital being rather narrow. The eye is situated nearly in the middle of the height of the head, and its diameter is $4\frac{1}{2}$ in the length of the latter. Cheeks and opercles scaly. The posterior edge of the præoperculum is emarginate and the angle rounded. The number of the branchiostegals cannot be distinctly ascertained; there appear to be six.

The dorsal fin begins immediately behind the vertical from the base of the pectorals; the spines are feeble, and can be entirely hidden in a groove: the soft dorsal and the anal are rather low, with a scaly sheath at the base; their distance from the caudal equals that between the orbit and the posterior extremity of the operculum. The pectoral is elongate and pointed; it extends to the vertical from the fourth anal ray, and its length is $3\frac{3}{4}$ in the total. The ventral is rather short, and composed of one feeble spine and five rays; it is attached to the belly by a membrane, and inserted immediately behind the vertical from the base of the pectoral. The anal spines are indistinct; the caudal is deeply forked.

The scales are smooth, cycloid, regularly arranged.

The colour is greenish-silvery, with narrow, shining, longitudinal streaks along the series of scales.

	inches.	lines.
Total length	14	9
Height of the body	4	6
Length of the head	3	4
Diameter of the eye	0	9
Length of the pectoral	4	0

14. PLATYSTETHUS.

Body oblong, compressed, with smooth scales of moderate size, which have the edge minutely serrated; cleft of the mouth narrow, oblique; snout obtuse, of moderate extent. Præopercular margin entire. The first dorsal continuous, with eight stout spines; the second and the anal are much more developed, and can be received in a scaly sheath; finlets none; anal spines three. Pectorals and ventrals rather short. Minute teeth in the jaws; palate smooth. Branchiostegals five or six.

Norfolk Island.

1. Platystethus cultratum.

Sciæna cultrata, *Forster*.
Cichla cultrata, *Bl. Schn.* p. 343.
Seriola cultrata, *Richards. Ann. & Mag. Nat. Hist.* xi. 1843, p. 169.

B. 5–6. D. $8 \Big| \frac{1}{24}$. A. $\frac{3}{30}$. L. lat. 60. L. transv. 5/14. Vert. 25.

Uniform silvery.

Norfolk Island.

a. Type of the species. Norfolk Island. Cook's Voyage.
b. Bad state. Norfolk Island. From the Collection of the Royal College of Surgeons.

Description.—The body is oblong and compressed, the edge of the abdomen rather sharp. The lateral portion of the breast is flat, and, in consequence of the high position of the pectoral fin, rather elevated. The greatest depth of the body is below the origin of the soft dorsal, and one-fourth of the total length. The length of the head is $5\frac{1}{3}$ in the total. The snout is $1\frac{1}{2}$ the diameter of the eye, which is $4\frac{1}{2}$ in the length of the head. The cleft of the mouth is very oblique, and the lower jaw projects slightly beyond the upper. The maxillary is broad and rounded posteriorly, and reaches to the vertical from the anterior margin of the eye. The nostrils are situated on the upper side of the snout, and nearer to the eye than to the extremity of the snout. The interorbital space is, like the crown, smooth and convex, and its width is much more than the diameter of the orbit. The eye is situated high up the side of the head. The cheek is scaly, there being four series of small scales between the præorbital and the interior præopercular ridge. The præoperculum has the limbs of equal length, and meeting at a right angle, which, however, is rounded. The other opercles are smooth and scaleless; the operculum has the posterior margin rounded; the sub- and interoperculum are rounded, and of nearly equal length.

The dorsal spines are stout, but rather short, the length of the longest being $3\frac{1}{2}$ in that of the head; they are connected by a membrane, and can be received in a sheath on the back. The distances of the occiput from the first dorsal spine and from the extremity of the snout are equal. The soft dorsal begins with a spine, a little before the middle of the distance between the occiput and the root of the caudal; it is rather low, and can be received in a scaly sheath;

its distance from the caudal is more than one-half the length of the head. The caudal is forked, of moderate length. The anal commences before the vertical from the origin of the soft dorsal, and terminates opposite to the end of the latter. The spines are stout, but short; the fin is low, and can be received in a scaly sheath. The pectoral is situated somewhat above the middle of the body, slightly pointed, rather short, one-sixth of the total length, and reaching to the vertical from the vent. The ventral is composed of a spine of moderate size, and five rays, inserted behind the vertical from the root of the pectoral, very short, one-eleventh of the total length, and not extending to the vent.

The scales are of moderate size, and higher than long; the lateral striæ run parallel to the edge, and the free portion is covered with excessively small prickles, the margin being minutely serrated; the posterior portion has neither striæ nor folds.

The colour is now uniform silvery.

	inches.	lines.
Total length	7	11
Height of the body	2	0
Length of the head	1	6
Diameter of the eye	0	4
Length of the pectoral	1	1
——— of the ventral	0	7

15. DITREMA.

Ditrema, *Schleg. Faun. Japon. Poiss.* p. 77.

The body is compressed and oblong, covered with smooth scales of moderate size; cleft of the mouth moderately wide, armed in both the jaws with a single series of small teeth; no teeth on the palate. A single dorsal, with a distinct spinous portion, formed by ten spines, the posterior of which are the longest; anal with three spines; ventrals thoracic, composed of one spine and five rays. A second opening behind the vent.

Sea of Japan.

1. Ditrema læve.

Ditrema, *Schleg. l. c.* pl. 40. f. 2.

(? B. 6.) D. $\frac{10}{20}$. A. $\frac{3}{27}$. V. 1/5. L. lat. 76.

Coloration uniform; the spinous dorsal edged with black. The ventrals are inserted somewhat behind the pectorals.

Sea of Japan.

a. Nine inches long: stuffed.

Third Group. CYTTINA.

Scombridæ with two distinct divisions of the dorsal fin, the spinous less developed than the soft. Body elevated, covered with very small or rudimentary scales, or with bony protuberances.

16. ZEUS.

Zeus, (*Artedi*) *Cuv. Règne Anim.*; *Cuv. & Val.* x. p. 4.

Body much compressed and elevated; cleft of the mouth wide. Scales exceedingly small or entirely absent. Two contiguous dorsals, the first with nine or ten spines, and not much shorter than the second; the anal with three or four spines; a series of bony plates along the base of the dorsal and anal fins; another series on the abdomen. Minute teeth in the jaws and on the vomer, none on the palatine bones. Branchiostegals seven; air-bladder large. Pyloric appendages in exceedingly great number.

Mediterranean; eastern parts of the Atlantic; Japanese and Australian Seas.

1. Zeus faber.

Zeus s. Faber, *Plin.* ix. cap. 18, xxxii. cap. 11.
Faber, *Ovid. Hal.* v. 110; *Colum.* viii. c. 16; *Wotton*, viii. c. 181. fol. 160 *b*; *Salv.* p. 203; *Aldrov.* i. c. 25. p. 112; *Jonston*, lib. i. tit. 2. cap. 1. art. 18. tab. 17. f. 1, 2.
Citula sive Sancti Petri piscis, *Paul. Jov.* cap. 27. p. 98.
Faber sive Gallus marinus, [*Rondel.* xi. cap. 19. p. 328]; *Gesner*, pp. 369, 439; *Willughby*, p. 294. tab. S. fig. 16; *Ray*, p. 99.
Zeus, sp. 1, *Artedi, Genera*, p. 50; *Gronov. Zoophyl.* no. 311, and *Mus. Ichthyol.* i. p. 47.
Poule de mer, *Duhamel, Pêches*, ii. sect. 5. p. 86.
Doree, *Pennant, Brit. Zool.* iii. p. 193. pl. 41.
Zeus faber, *L. Syst.* i. p. 454; *Brünn. Pisc. Massil.* p. 33; *Bl.* tab. 41; *Bl. Schn.* p. 94; *Lacép.* iv. p. 577; *Donov. Brit. Fishes*, i. pl. 8; *Risso, Ichth. Nice*, p. 303, and *Eur. Mérid.* iii. p. 379; *Martens, Reise nach Venedig*, ii. p. 435; *Yarrell, Brit. Fishes*, i. p. 183; *Parn. Fishes Frith of Forth*, p. 60; *Cuv. & Val.* x. p. 6; *Cuv. Règne Anim. Ill. Poiss.* pl. 60. f. 1; *Gronov. Syst. ed. Gray*, p. 128; *Lowe, Trans. Zool. Soc.* ii. p. 183; *Webb & Berth. Iles Canar. Poiss.* p. 59; *Guichen. Explor. Algér. Poiss.* p. 64.
Zeus australis, *Richards. Ichth. Ereb. & Terr.* pp. 36, 138. pl. 25. f. 1.
Skeleton: *Rosenth. Ichthyot. Tafeln.* pl. 13; *Geoffr. Ann. Mus.* ix. p. 425. pl. 29; *Agass. Rech. Poiss, Foss.* v. p. 31. tab. B.

D. 10 | 22. A. 4 | 21. Vert. 14/18.

Nine, eight, or seven, occasionally ten, bony plates along the base of the soft dorsal, nine along that of the anal, but none at the base of the spinous dorsal; each of the plates armed with a pair of spines; scapular region with a slight ridge; præoperculum spineless; a series of spiny plates between the ventral and the anal. A round black spot in the middle of the side.

Mediterranean; Atlantic coasts of Europe; Australian Seas.

a. Fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.

b. Adult: stuffed. British coast.
c. Half-grown: skin. Plymouth. From Mr. Yarrell's Collection.
d. Half-grown: skin. South Devonshire. From Mr. Yarrell's Collection.
e. Young. South Devonshire. Museum Leach.
f. Half-grown: stuffed. Frith of Forth. From Dr. Parnell's Collection.
g. Adult: skin. Australia.—Type of *Z. australis*, Richards.
h–k. Half-grown and young: skins.
l–n. Half-grown: bad state.
o, p. Adult: skeletons.

2. **Zeus japonicus.**

Krusenst. Reise Atl. taf. 51. f. 1.
Zeus japonicus, *Cuv. & Val.* x. p. 24; *Bleek. Verh. Batav. Genootsch.* xxvi. *Japan*, p. 105.
—— faber japonicus, *Faun. Japon. Poiss.* p. 123. pl. 66 A.

D. 10 | 22. A. 4 | 21.

Six, occasionally seven, bony plates along the base of the soft dorsal and anal, but none at the base of the spinous portions; each of the plates armed with a pair of spines; scapular region and præoperculum spineless; a series of spiny plates between the ventral and anal fins. A round black spot in the middle of the side.

Sea of Japan.

3. **Zeus capensis.**

Cuv. & Val. x. p. 23.

D. 10 | 22. A. 4 | 22.

Eleven bony plates along the bases of the soft dorsal and anal fins, but none at the base of the spinous dorsal; each of the plates armed with a single spine; præorbital, præoperculum, scapular and humeral regions spineless; a series of plates between the ventral and anal, which are provided with a ridge, but not with spines.

Cape Seas.

a. Two feet long: stuffed.

4. **Zeus pungio.**

Faber, *Rondel.* xi. cap. 19. p. 328.
Zeus pungio, *Cuv. & Val.* x. p. 25. pl. 280; *Guichen. Explor. Algér. Poiss.* p. 64.

D. 10 | 23. A. 4 | 22.

Four or five bony plates along the base of the soft dorsal, nine along that of the anal, but none at the base of the spinous dorsal; each of the plates armed with a pair of strong spines; scapular and humeral regions with a flat and prominent spine; præoperculum generally with two spines, præorbital with a single one, pointing outwards; a series of spiny plates between the ventral and anal. A round black spot in the middle of the side.

Mediterranean.

a. Fine specimen. Dalmatia.
b. Fine specimen.

5. Zeus nebulosus.

Schleg. Faun. Japon. Poiss. p. 123. pl. 66.

D. 10 | 26. A. 3 | 26.

Seven bony plates along the base of the spinous dorsal, six along that of the soft, and eight along that of the anal; each of the plates armed with a single spine; præorbital, præoperculum, and scapula spineless; coracoid with a flat spine of moderate size; a series of plates between the ventral and anal, the ridges of each plate terminating posteriorly in a spine. Body scaleless, irregularly marbled with blackish.

Sea of Japan.

a. Adult: stuffed. Japan. Purchased of Mr. Frank.

6. Zeus conchifer.

Lowe, Proc. Zool. Soc. 1850, p. 247.

D. 10 | 24. A. 3 | 26. Vert. 13/21.

Three bony plates along the base of the spinous dorsal, four along that of the soft, and six along that of the anal; each of the plates is armed with a single spine; præorbital, præoperculum, and scapula spineless; coracoid with a flat spine of moderate size; a series of plates between the ventral and anal, the ridges of each plate terminating posteriorly in a very short spine. Body scaleless.

Sea of Madeira.

a. Twenty-seven inches long: skin. Madeira. From the Rev. R. T. Lowe's Collection.—Type of the species.

Description.—This species differs widely from *Zeus faber*, and is nearest to the Japanese species, *Z. nebulosus*; but it may be readily distinguished by the extent of the bony plates along the base of the spinous dorsal, by the large size of those plates, and finally by its three anal spines. In its general form it does not differ from the other species of *Zeus*. The colours have gone, but it must be observed, that there is not the slightest trace of a lateral black spot, which is said to be present during life. There are two bucklers covering the breast before the ventral fins; each of them is composed of a single bone; the anterior is one-half the size of the second, and has a small spine in its centre; the second is provided with a pair of small spines. The abdomen is cuirassed with eight pairs of bucklers, those of the one side being separated by a suture from their fellows on the other side: the vent is situated between the last pair. Each plate has a slight ridge terminating in an indistinct point.

17. CYTTUS*.

Zeus, sp., *Lowe, Proc. Zool. Soc.* 1843, p. 85.
Capros, sp., *Richards. Trans. Zool. Soc.* iii. p. 72.

Body compressed and elevated, covered with very small scales; mouth protractile. Two contiguous dorsal fins, the first with eight or nine spines, the anal with two. No bony plates along the base of the dorsal and anal fins. Ventral fins composed of one spine and six or eight soft rays. Minute teeth in the jaws and on the vomer, none on the palatine bones. Branchiostegals eight.

Australian Seas; Sea of Madeira.

1. Cyttus australis.

Capros australis, *Richards. Trans. Zool. Soc.* iii. p. 72, and *Ann. & Mag. Nat. Hist.* xi. p. 171, and *Ichthyol. Ereb. & Terr.* p. 137. pl. 59. f. 1–5.

B. 8. D. 9 | 28. A. 2 | 30. V. 1/6.

The upper and lower profiles of the snout are straight. Scales very small. The spines of the dorsal and ventral fins are elongate and flexible, those of the anal short. The ventrals can be received in a sheath on the abdomen, and cover the vent. Silvery.

Coasts of Tasmania and southern parts of Australia.

a, b. Types of the species. Presented by Sir J. Richardson.

2. Cyttus roseus.

Zeus roseus, *Lowe, l. c.*

B. 8. D. 8 | 28. A. 2 | 29. V. 1/8.

The upper and lower profiles of the snout are straight. Scales very small. The spines of the dorsal and ventral fins are stout and striated; those of the anal short, the first being very stout and immoveable. Three bony plates between the ventrals and the vent, each having a longitudinal ridge.

Sea of Madeira.

a. Eleven inches long: not good state.—Probably type of the species.

18. OREOSOMA.

Oreosoma, *Cuv. & Val.* iv. p. 515.

Lowe† is certainly right in assigning this group as the proper place for *Oreosoma*. For characters of the genus and species, see p. 214 of the first volume of this work.

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* κυττὸς, an unknown fish, mentioned by *Athenæus, Deipn.* vii. p. 325 B

† Fishes of Madeira, Preface, p. xii

Fourth Group. STROMATEINA.

Scombridæ with one long dorsal fin, without distinct spinous division; toothed processes extend into the œsophagus.

19. STROMATEUS*.

Stromateus, *Artedi, Genera*, p. 19; *Cuv. & Val.* ix. p. 372.
Apolectus, *Cuv. & Val.* viii. p. 438.
Rhombus, *Cuv. & Val.* ix. p. 400.
Peprilus, *Cuv. Règne Anim.*
Seserinus, *Cuv. & Val.* ix. p. 416.

Body compressed, more or less elevated, covered with very small scales; the cleft of the mouth of moderate width, or rather narrow. A single long dorsal and anal, with rudimentary spines anteriorly; both scaly. Ventral fins none in the adult state. A single series of minute teeth, inserted in the acute margins of the jaws; palate and tongue smooth. The œsophagus is armed with numerous bony, barbed teeth. Five, six or seven branchiostegals; pseudobranchiæ present; air-bladder none. Pyloric appendages in very great number.

Inhabitants of nearly all the tropical and temperate seas.

1. Stromateus fiatola.

Στρωματεὺς, *Athen.* vii. v. 322.
Stromateus, *Rondel.* v. cap. 24. p. 157; *Gesner, Aquat.* iv. p. 925; *Aldrov.* ii. c. 22. p. 192; *Jonston*, i. tit. 3. cap. 1. art. 12. tab. 19. f. 7; *Willughby*, pp. 156, 157. pl. 1 & 4. f. 2; *Ray*, p. 50.
Fiatola (Callichthys), *Bellon.* p. 153; *Gesner*, p. 926; *Rondel.* viii. cap. 21. p. 257; *Aldrov.* ii. c. 24; *Jonston*, i. tit. 3. cap. 1. art. 13. tab. 19. f. 8.
Hepatus, *Gesner*, p. 413.
Stromateus, sp., *Artedi, Genera*, p. 19.
Stromateus fiatola, *L. Syst.* i. p. 432; *Bl. Schn.* p. 492; *Lacép.* ii. p. 316; *Cuv. & Val.* ix. p. 373. pl. 272; *Risso, Ichth. Nice*, p. 100; *Martens, Reise nach Venedig*, ii. p. 435; *Cuv. Règne Anim. Ill. Poiss.* pl. 63. fig. 1; *Bonap. Faun. Ital. Pesci*, cum fig.; *Guichen. Explor. Algér. Poiss.* p. 64.
Chrysostromus fiatoloides, *Lacép.* iv. pp. 697, 698.

$$\text{D.}\,\tfrac{5}{40}.\quad \text{A.}\,\tfrac{3}{33}.$$

Scales exceedingly small; a rudiment of the ventrals visible, hidden below the skin; pelvis without spine; no pores along the base of the dorsal. The height of the body is contained three times in the total length, the length of the head $5\frac{1}{3}$. The vertical fins not elevated. Above bluish, with golden spots; on the sides and on the belly silvery, with oblong blackish spots.

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* 1. Stromateus argenteus, *Euphrasen, Vetensk Acad. Nya Handl. Stockh.* ix. 1788, p. 49. tab. 9.—Stromateus aculeatus, *Bl. Schn.* p. 492; *Cuv. & Val.* ix. p. 394.—Sea of China.

2. Seserinus xanthurus, *Quoy & Gaim. Voy. Freyc. Zool.* p. 384.—Rhombus xanthurus, *Cuv. & Val.* ix. p. 405; *Sloane, Jamaica*, ii. p. 281. pl. 250. f. 4.—Atlantic coasts of tropical America.

Mediterranean.

a–c. Adult. Mediterranean. Purchased of Mr. Frank.

2. Stromateus microchirus

Seserinus, *Rondel.* ix. cap. 20. p. 257.
Centrolophus microchirus, *Bonelli in Mem. Accad. Sc. Torin.*
Fiatola fasciata, *Risso, Eur. Mérid.* iii. p. 289.
Seserinus michochirus, *Cuv. & Val.* ix. p. 416. pl. 276.
—— rondeletii, *Cuv. Règne Anim. Ill. Poiss.* pl. 63. f. 3.
Stromateus microchirus, *Bonap. Faun. Ital. Pesci*, cum fig.

B. 6. D. 49–50. A. 35–37. V. $\frac{1}{3-5}$.

Scales very small. Ventrals rudimentary, thoracic. The height of the body is $2\frac{1}{3}$ in the total length, the length of the head four times. The vertical fins not elevated. Greyish, with eight or nine blackish vertical bands.

Mediterranean.

This species loses, perhaps, the ventral fins with age.

3. Stromateus maculatus.

Cuv. & Val. ix. p. 399; *Jenyns, Zool. Beagle, Fishes*, p. 74; *Gay, Hist. Chile, Zool.* ii. p. 248, *Atl. Ictiol.* lam. 3 bis, f. 1.

B. 6. D. $\frac{7}{40}$. A. $\frac{3}{38}$.

Scales exceedingly small; no trace of the ventral fins whatever; pelvis without spine; no pores along the base of the dorsal. The height of the body is contained three times in the total length, the length of the head $5\frac{1}{4}$. The vertical fins not elevated. Above bluish, with numerous round blackish spots; below silvery.

Pacific coast of South America.

a. Adult. South America. From Mr. Bridge's Collection.

4. Stromateus triacanthus.

Stromateus triacanthus, *Peck, Mem. Amer. Acad.* ii. pt. 2. p. 48. pl. 2. f. 2.
—— cryptosus, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 365. pl. 1. f. 3.
Peprilus cryptosus, *Cuv. Règne Anim.*
Rhombus cryptosus, *Cuv. & Val.* ix. p. 408.
Peprilus triacanthus, *Storer, Rep. Massach.* p. 60.
Rhombus triacanthus, *Dekay, New York Fauna, Fishes*, p. 137. pl. 2 f. 80.

D. $\frac{3}{43-45}$. A. $\frac{3}{38}$. Vert. $\frac{14}{17}$.

Scales small; no trace of the ventrals whatever; pelvis with a prominent spine; a series of large pores along the base of the dorsal. The height of the body is $2\frac{3}{4}$ in the total length, the length of the head $5\frac{1}{4}$. The vertical fins not elevated. Coloration uniform.

Atlantic coasts of the United States.

a. Fine specimen. Boston. Presented by B. Winstone, Esq.
b. Adult: skin. New York.
c. Adult: not good state. North America. Purchased of Mr. Warwick.

5. Stromateus gardenii.

Chætodon alepidotus, *L. Syst.* i. p. 460.
Sternoptyx gardenii, *Bl. Schn.* p. 494.
Stromateus longipinnis, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 366.
Rhombus longipinnis, *Cuv. & Val.* ix. p. 401. pl. 274; *Dekay, New York Fauna, Fishes*, p. 136. pl. 75. f. 239.
—— argentipinnis, *Cuv. & Val.* ix. p. 405.
Peprilus longipinnis, *Cuv. Règne Anim. Ill. Poiss.* pl. 63. f. 2.

$$D. \frac{4-5}{40-43}. \quad A. \frac{3-4}{38-43}.$$

Scales rather small; no trace of the ventrals whatever; pelvis with a small spine. The height of the body is $1\frac{2}{3}$ in the total length, the length of the head five times; the dorsal, and especially the anal, elevated anteriorly; the base of the first soft dorsal ray falls vertically above the root of the pectoral in immature specimens, and immediately behind it in adult ones. Caudal lobes equal in length. Coloration uniform.

Atlantic coasts of tropical America.

a, b. Half-grown. New Orleans. Purchased of Mr. Cuming.
c. Half-grown. Lake Champlain. Purchased of Mr. Frank.
d, e. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
f. Adult: bad state. Bahia. Purchased of M. Parzudaki.
g. Adult: bad state.

Rhombus crenulatus (Cuv. & Val. ix. p. 410. pl. 275, and Cuv. Règne Anim. Ill. Poiss. pl. 64. f. 3) may prove to be merely the young state of *Stromateus gardenii*.

6. Stromateus atous.

Atookoia, *Russell*, i. p. 33. f. 44.
Stromateus sinensis, *Euphras. Vetensk. Acad. Nya Handl. Stockh.* ix. p. 49. t. 9; *Bl. Schn.* p. 492; *Cant. Catal.* p. 140.
—— atous, *Cuv. & Val.* ix. p. 389; *Richards. Ichth. Chin.* p. 273.
—— albus, *Cuv. & Val.* ix. p. 388; *Cant. Ann. & Mag. Nat. Hist.* ix. p. 15.
—— candidus, *Bleek. Ichth. M. O. Jav.* p. 9 (not *Cuv. & Val.*).
Stromateoides atokoia, *Bleek. Makr.* p. 369, and *Verh. Bat. Gen.* xxiv. *Makr.* p. 76.

B. 5. D. 48–50. A. 39–40.

Scales very small. Ventrals none. The height of the body is $1\frac{1}{2}$–

$1\frac{2}{3}$ in the total length, the length of the head $4\frac{1}{4}$–$5\frac{1}{2}$; dorsal and anal fins not produced, with the spines hidden and cartilaginous; caudal lobes equal in length; lateral line not keeled. Greyish, generally minutely dotted with brown.

East Indian Seas.

7. Stromateus cinereus.

Russell, i. p. 34. f. 45 (juv.).
Stromateus cinereus, *Bl.* xii. p. 90. t. 420 (middle age); *Bl. Schn.* p. 491; *Shaw, Zool.* iv. p. 109; *Cant. Catal.* p. 143.
—— griseus, *Cuv. & Val.* ix. p. 395.
Stromateoides cinereus, *Bleek. Makr.* p. 368, and *Verh. Bat. Gen.* xxiv. *Makr.* p. 75.

B. 7. D. 7–8 $\Big|\frac{1}{39\text{–}41}$. A. 5 $\Big|\frac{1}{32\text{–}39}$.

Scales very small. Ventrals none. The height of the body is one-half of the total length, the length of the head one-fifth. Dorsal and anal spines truncated and trenchant, more conspicuous in immature specimens than in adult ones; dorsal and anal fins produced anteriorly. The lobe of the dorsal equals the length of the pectorals, which are $2\frac{2}{3}$ in the total. The upper caudal lobe is only one-half of the lower, which equals the length of the body, the caudal not included. The length of the anal lobe is equal to, or shorter than, the lower one of the caudal. Lateral line not keeled. Greyish: sides of the head and the vertical fins minutely dotted with black.

East Indian Seas.

a. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.

8. Stromateus argenteus.

Stromateus argenteus, *Bl.* xii. p. 92. tab. 421; *Shaw, Zool.* iv. p. 110; *Cuv. & Val.* ix. p. 393; *Cant. Catal.* p. 142; *Richards. Ichth. Chin.* p. 272.
Russell, pp. 31, 35. pl. 42.
Stromateus candidus, *Cuv. & Val.* ix. p. 391; *Bélanger, Voy.* p. 369. pl. 2. f. 2.
—— securifer, *Cuv. & Val.* ix. p. 394. pl. 273 (young); *Cant. Ann. & Mag. Nat. Hist.* ix. p. 15; *Richards. Ichth. Chin.* p. 273.
? Stromateus punctatissimus, *Schleg. Faun. Japon. Poiss.* p. 121. pl. 65.

B. 6. D. 5–9 $\Big|\frac{1}{39\text{–}43}$. A. 6 $\Big|\frac{1}{34\text{–}38}$. Vert. 15/21.

Scales very small. Ventrals none. The height of the body is one-half of the total length, the length of the head one-fifth. Dorsal and anal spines truncated and trenchant, more conspicuous in immature specimens than in adult ones; dorsal and anal fins produced anteriorly. The base of the first soft dorsal ray falls vertically at some distance behind the base of the pectoral; the length of the anal lobe exceeds slightly that of the dorsal, and equals in length the pectoral, which, as well as the caudal lobes, is one-third of the total length. Lateral line not keeled. Silvery-grey, minutely dotted with black.

East Indian Seas.

a. Adult. China.
b. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
c, *d*. Adult. Amoy (China).
e, *f*. Young. China. From Dr. Cantor's Collection.
g. Adult: bad state. From the Collection of the Zoological Society.
h. Half-grown. From the Collection of the Zoological Society.
i. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.
k, *l*. Half-grown. Presented by Sir J. Richardson.
m. Half-grown: dried. [? West India Islands.] Purchased of Mr. Scrivener.
n. Half-grown.
o. Skeleton. Purchased.

I refer a *skeleton*, not in a good state of preservation, which has been purchased with the name of *Stromateus macropterus*, to this species. The occipital crest is well developed, and extends on to the front part of the snout; the lateral crests are much lower and shorter; the upper part of the orbit is swollen and rugose. There are fifteen abdominal and twenty-one caudal *vertebræ**, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·5; the vertebræ are compressed in their longitudinal diameter. The hæmal spines are stronger and longer than the neurals, and the anterior ones compressed, so as to be in immediate contact with one another. The interhæmals and the interneurals do not leave an interspace between the single spines, and are highest on the middle of the body. The first interhæmal is strong and long, directed obliquely backwards, and forked at its upper extremity, the fork embracing the four anterior hæmals. The ulna is very broad; the pubic bones are confounded into a single sabre-shaped bone, extending from the symphysis of the humeral bones nearly to the lower extremity of the first interhæmal.

9. Stromateus niger.

Renard, i. pl. 5. f. 38; *Russell*, i. p. 32. pl. 43.
Stromateus niger, *Bloch*, xii. p. 93. taf. 422; *Bl. Schn.* p. 492. tab. 93; *Shaw, Zool.* iv. p. 111; *Cuv. & Val.* ix. p. 385; *Cant. Ann. & Mag. Nat. Hist.* ix. p. 15, and *Catal.* p. 139; *Richards. Ichth. Chin.* p. 272; *Bleeker, Makr.* p. 370, and *Verh. Bat. Gen.* xxiv. *Makr.* p. 77.
—— paru, *Bl.* v. p. 75; *Bl. Schn.* p. 491; *Lacép.* ii. p. 319; *Shaw, Zool.* iv. p. 108.
—— fiatola, *Bl.* tab. 160.
Apolectus stromateus, *Cuv. & Val.* viii. p. 439. pl. 238; *Cant. Catal.* p. 123.
? Seserinus vachellii, *Richards. Ichth. Chin.* p. 273.

B. 7. D. $\frac{5}{42-44}$. A. $\frac{3}{35-37}$.

Scales small. Ventrals jugular and slender in young specimens, entirely disappearing with age. The height of the body is 2–2½ in the total length, the length of the head 3¾–4½; dorsal and anal fins elevated anteriorly; caudal lobes equal in length. The lateral line is keeled and shielded posteriorly. Uniform brownish or greyish.

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* Cuvier states fifteen abdominal, and as many caudal vertebræ in his *Rhombus xanthurus*.

East Indian Seas.

a. Adult: stuffed. China Seas. Presented by J. R. Reeves, Esq.

b–e. Half-grown: skins. Malayan Peninsula. From Dr. Cantor's Collection.

f. Young. Purchased of Mr. Frank.

20. CENTROLOPHUS.

Centrolophus, *Lacép.* iv. p. 441!; *Cuv. & Val.* ix. p. 330.

Body rather compressed, more or less oblong, covered with very small scales; the cleft of the mouth of moderate width. A single long dorsal, without distinct spinous division; anal scaly, like the dorsal, anteriorly with three feeble spines. A single series of minute teeth in the jaws; palate and tongue smooth. The epibranchial bone of the fourth arch with long toothed processes. Seven branchiostegals; pseudobranchiæ present; air-bladder small. Pyloric appendages in moderate number.

Mediterranean and the neighbouring parts of the Atlantic, northwards to the British coast.

1. Centrolophus britannicus.

Gthr. Ann. & Mag. Nat. Hist. 1860, July, p. 46.

B. 7. D. 45. A. 30.

The height of the body is one-fifth of the total length, the length of the head one-sixth. The maxillary reaches to below the anterior margin of the eye. The length of the dorsal fin is 1⅘ in the total, that of the anal 3⅓. Scales exceedingly small. Uniform brown.

Sea off Polperro.

a. Adult: stuffed. Polperro.

Description of the specimen.—This species differs greatly from *Centrolophus pompilus* in the form and number of the fin-rays. The upper profile descends from the dorsal fin in a scarcely stronger curvature than that in which the lower one ascends. The greatest depth of the body is below the second quarter of the dorsal fin, and one-fifth of the total length; the length of the head is one-sixth of the total. The snout is short, obtuse, and appears to be scarcely longer than the diameter of the eye, which is situated at a distance from the extremity of the operculum twice greater than that from the end of the snout. The jaws are armed with a series of minute teeth. The rays of all the fins are much more slender and shorter than in *C. pompilus*. The dorsal fin commences in the vertical from the base of the ventrals, and its distance from the occiput equals that from the caudal; the rays are very feeble, low, and the fin is not elevated on its anterior third, as in *C. pompilus.* The point where the spines pass into rays cannot be distinguished. The fin is scaly. The caudal fin is forked, and its length one-sixth of the total. The anal fin commences vertically below the nineteenth dorsal ray, and terminates opposite to the end of the dorsal fin; it is low, like the dorsal, anteriorly not elevated, scaly; the length of its base is $3\frac{1}{3}$ in the total. Pectorals small, with an elongate triangular lobe of the humeral above. The root of the ventrals falls vertically immediately behind that of the pectoral; they are very small.

Scales exceedingly small. The lateral line makes a short curve above the pectoral, and runs from thence along the middle of the body.

Colour uniform brown.

	inches.	lines.
Total length	19	0
Height of the body	3	10
Length of the head	3	0
Width between the orbits	1	1
Length of the dorsal fin	10	3
Distance of the dorsal fin from the extremity of the snout	4	2
Length of the caudal fin	3	2
Length of the anal fin	5	9

2. **Centrolophus pompilus.**

The Black-fish.

Pompilus, *Rondel.* viii. cap. 14. p. 250; *Gesn. Aquat.* iv. p. 753; *Aldrov.* iii. c. 19. p. 325; *Jonston,* i. lib. i. tit. i. cap. 2. art. 2. tab. 3. f. 5; *Ray, Syn.* p. 101.

Pompilus rondeletii, *Will.* p. 215. tab. O. 1. f. 6; *Lowe, Proc. Zool. Soc.* 1839, p. 81, and *Trans. Zool. Soc.* iii. p. 7.

? Coryphæna pompilus, *L. Syst.* i. p. 447; (*Bl. Schn.* p. 296; *Lacép.* iii. p. 198; *Risso, Ichth. Nice,* p. 180).

Black-fish, *Jago in Borlase, Nat. Hist. of Cornw.* p. 271. pl. 26. f. 8.

Black Ruffe, *Penn. Brit. Zool.* iii. p. 228.

Merle, *Duham. Pêches,* ii. sect. iv. p. 37. pl. 6. f. 2.

Perca nigra, *L. Gm.* i. p. 1321.

Holocentrus niger, *Lacép.* iv. pp. 330, 357.

Centrolophus niger, *Lacép.* iv. pp. 441, 442. pl. 10. f. 2.

—— pompilus, *Cuv. & Val.* ix. p. 334. pl. 269, cop. by *Yarrell, Brit. Fishes,* 3 edit. i. p. 247; *Cuv. Règne Anim. Ill. Poiss.* pl. 65. f. 2; *Bonap. Faun. Ital. Pesc.* cum fig.; *Guichen. Explor. Algér. Poiss.* p. 63.

Acentrolophus maculosus, *Nardo, Prodr. Ichth. Adr.* sp. 62.

Centrolophus morio, *Cuv. & Val.* ix. p. 342.

—— liparis, *Risso, Eur. Mérid.* iii. p. 337; *Cuv. & Val.* ix. p. 345.

B. 7. D. 39–41. A. 23–25. Cæc. pylor. 9. Vert. 11/14.

The height of the body is one-fourth of the total length, the length of the head one-fifth. The maxillary reaches to below the anterior margin of the eye The length of the dorsal fin is $2\frac{1}{8}$ in the total, that of the anal $3\frac{3}{5}$. Scales very small. Uniform blackish, or with irregular light spots.

Mediterranean; coasts of France and south coast of England.

a. Adult.
b. Half-grown. From the Haslar Collection.

3. Centrolophus ovalis.

Centrolophus ovalis, *Cuv. & Val.* ix. p. 346.
Leirus bennettii, *Lowe, Proc. Comm. Zool. Soc.* 1833, i. p. 143, and *Trans. Cambr. Philos. Soc.* vi. p. 199. tab. 5, and *Trans. Zool. Soc.* ii. p. 179.
Pompilus bennettii, *Lowe, Proc. Zool. Soc.* 1839, p. 82, and *Trans. Zool. Soc.* iii. p. 8.
Crius bennettii, *Valenc. in Webb & Berthel. Iles Canar. Poiss.* p. 43.

B. 7. D. $\frac{6-8}{30-32}$. A. $\frac{3}{21-24}$. L. lat. ca. 90. Vert. 25. Cæc. pylor. 5.

The height of the body is one-third of the total length, the length of the head one-fourth. Caudal emarginate. Brownish (in spirits).

Sea off Nizza; Seas of Madeira and the Canary Islands.

a, b. Fine specimens. Madeira. Presented by the Rev. R. T. Lowe.

The differences of *Centrolophus crassus*, Cuv. & Val. ix. p. 348, are not yet sufficiently pointed out.

Fifth Group. CORYPHÆNINA.

Scombridæ with one long dorsal fin without distinct spinous division. No teeth in the œsophagus.

21. CORYPHÆNA*.

Coryphæna, (*Artedi*) *Cuv. & Val.* ix. p. 268.
Lampugus, *Cuv. & Val.* ix. p. 317.

Body compressed, rather elongate; adult specimens with an elevated crest on the skull; cleft of the mouth wide. A single dorsal, extending from the occiput nearly to the caudal, which is deeply forked; no distinct dorsal and anal spines; the ventrals are well developed, and can be partly received in a groove on the abdomen. Scales very small. Cardiform teeth in the jaws, on the vomer and the palatine bones; a patch of villiform teeth on the tongue. Branchiostegals seven; pseudobranchiæ and air-bladder absent. Pyloric appendages exceedingly numerous.

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* 1. Guaracapema, *Marcgr.* p. 160; Coryphæna marcgravii, *C. & V.* ix. p. 301.—Tropical parts of the Atlantic.
2. Coryphæna suerii, *C. & V.* ix. p. 302; Coryphæna globiceps, *Dekay, New York Fauna, Fishes*, p. 132. pl. 10. f. 29.—Atlantic coasts of the United States.
3. *Renard*, ii. 16, 76; Coryphæna vlamingii, *C. & V.* ix. p. 315.—East Indies.
4. Coryphæna fasciolata, *Pall. Spicil.* viii. tab. 3. f. 2; Lampugus fasciolatus, *Cuv. & Val.* ix. p. 328.—Amboyna.
5. —— nortoniana, *Lowe, Proc. Zool. Soc.* 1839, p. 80, and *Trans. Zool. Soc.* iii. p. 6.—Sea of Madeira.
6. —— azurea, *Less. Voy. Duperrey, Zool.* ii. p. 153; Coryphæna lessonii, *Cuv. & Val.* ix. p. 307.—Tropical parts of the Atlantic.
7. —— socialis, *Bennett, Whaling Voyage*, ii. p. 274.—Tropical parts of the Pacific.

Inhabitants of the high seas of the temperate and tropical regions.

In the last part of the *Histoire Naturelle des Poissons*, prepared by Cuvier himself, an incomplete note by some author, or a rough sketch by a traveller, a different locality, a slight modification of an organ, accidental in an individual specimen, or dependent on age, have been deemed sufficient reasons by him for the creation of a number of species, the names of which will be a heavy encumbrance to the synonymy for a long time to come. This tendency in the later years of Cuvier appears to culminate in his treatment of *Coryphæna*. He declared himself to be rather uncertain as to the importance of the different relative height of the crest on the neck, and acknowledges the possibility of the existence of sexual differences (pp. 311 & 314); but he did not notice the remarkable circumstance that all his specimens with a high crest and an elevated dorsal fin (*Coryphæna*) were of large size, whilst his genus *Lampugus* was composed of fishes not exceeding 2 feet in length! I have no doubt, from comparison not only of the specimens in this collection, but of many others, that the crest and the anterior part of the dorsal fin become gradually higher with age, and that *Lampugus* is the immature state of *Coryphæna*. Whether there is also a slight difference between the sexes in this respect, I am not able to decide.

The single species of *Coryphæna* are difficult to distinguish. If the coloration really were of great specific value, those who examine preserved specimens cannot avail themselves of it. We depend, therefore, entirely on the relative height of the body and on the number of the fin-rays, which, in spite of its being considerable, appears to be very constant in the different species. We are enabled, by these characters, to circumscribe several very distinct forms. Cuvier has not acknowledged the identity of the Atlantic and Indian *Coryphænæ* (although he has done so in other genera), and yet he could not point out their differences. In a family like the *Scombridæ*, which is nearly entirely composed of fishes inhabiting the high seas, and endowed with a wonderful power of swimming, it is of no consequence whether the same species be found in the Atlantic, in the Indian Ocean, and in the Pacific.

1. Coryphæna hippurus.

A. *Doubtful synonymy.*

Κορύφαινα, *Aristot.* lib. v. c. 10.
Ἵππουρος, *Aristot.* lib. viii. c. 15; *Athen.* lib. vii. v. 304; *Oppian.* i. 184, iii. 186, iv. 404.
Hippurus, *Ovid. Hal.* v. 95; *Plin.* lib. ix. c. 16, lib. xxxii. c. 11.

Dorade, *Marcgr.* p. 180; *Leguat, Voyage*, p. 21 (faulty figure); *Rochefort, Hist. Nat. Antilles*, p. 170; *Dutertre, Hist. Nat. Antill.* pp. 212, 295. fig.
Renard, i. 22, 123.
Piscis aurantius, *Hernand. Nieremb. Hist. Nat. Peregr.* p. 255.
Dolphin, Dauphin, *Lebrun, Voyage*, ii. p. 325. pl. 189; *Duhamel, Pêches*, sect. iv. pl. 1. f. 1; *Guettard, Nouv. Observ. sur les Sc. et Arts.* iv. p. 437; *Dampier, Voy. New Holland*, i. pl. 2. f. 7.

B. *Adult state.*

Hippurus, *Rondel.* viii. c. 19. p. 255; *Gesner*, pp. 423, 501: *Aldrov.* iii. c. 17. p. 306; *Jonston*, i. tit. 1. cap. 1. art. 6. tab. 1. f. 12; *Willughby*, p. 213. pl. O. 1. f. 5; *Ray, Syn.* p. 100.
Coryphæna, no. 1, *Artedi, Genera*, p. 15; *Brown, Jamaica*, p. 443.
—— hippurus, *L. Syst.* p. 446; *Osbeck, Reise nach China*, p. 403; *Bl.* tab. 174; *Bl. Schn.* p. 295; *Lacép.* iii. pp. 173, 178; *Shaw, Zool.* iv. p. 212. pl. 32. f. 1; *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 378; *Risso, Ichth. Nice*, p. 178, and *Hist. Nat. Eur. Mérid.* iii. p. 339; *Cuv. & Val.* ix. p. 278. pl. 266; *Guichen. Explor. Sc. Algér. Poiss.* p. 63: *Lowe, Trans. Zool. Soc.* ii. p. 183, iii. p. 6, and *Proc. Zool. Soc.* 1839, p. 80; *Bonap. Faun. Ital. Pesci*, cum fig. (juv.).
—— chrysurus, *Lacép.* ii. pl. 18. f. 2; *Cuv. & Val.* ix. p. 309.
—— dorado, *Cuv. & Val.* ix. p. 303; *Cuv. Règne Anim. Ill. Poiss.* pl. 65. f. 1.
—— dolfyn, *Cuv. & Val.* ix. p. 305.
—— virgata, *Cuv. & Val.* ix. p. 308.
—— japonica, *Schleg. Faun. Japon. Poiss.* p. 120. pl. 64.
—— argyrurus, *Cuv. & Val.* ix. p. 314.

C. *Immature state.*

? Coryphæna immaculata, *Spix, Pisc. Bras.* p. 111. tab. 56.
Lampugus pelagicus, *Cuv. & Val.* ix. p. 318.
? Lampugus immaculatus, *Cuv. & Val.* ix. p. 329.

B. 7. D. 58–60. A. 25–27. Vert. 31.

The height of the body equals the length of the head, and is one-fifth of the total (without caudal). The maxillary reaches nearly to the vertical from the centre of the eye. The origin of the anal falls vertically below the middle of the total length (without caudal), or below the thirty-sixth dorsal ray. Specimens preserved in spirit, or dried, exhibit blackish spots on the white ground-colour of the lower parts.

Mediterranean; Atlantic; Indian Ocean; Pacific.

a. Three feet long: skin. Cape Seas. Presented by Sir A. Smith.
b. Fifty inches long: skin: not good state. Cape Seas. Presented by Sir A. Smith.
c. Five feet long: stuffed. Ile de France.
d. Forty-four inches long: stuffed. Purchased of Mr. Jonston.
e. Thirty-four inches long: stuffed: not good state. From the Collection of the Zoological Society.
f. Thirty-three inches long: stuffed. Presented by C. Rawden, Esq.
g. Twenty-four inches long: stuffed. Madeira. From the Collection of the Rev. R. T. Lowe.
h. Seventeen inches long.

i. Fourteen inches long.

k. Thirty-five inches long: stuffed: painted green; shining golden on the back, with large round golden spots; lower parts golden; caudal dark green.

2. **Coryphæna pelagica.**

Scomber pelagicus, *L. Mus. Ad. Fried.* p. 72. pl. 30. f. 3, and *Syst. Nat.* i. p. 490; *L. Gm.* i. p. 1336; *Gronov. Zoophyl.* sp. 306.
Caranxomorus pelagicus, *Lacép.* vii. p. 26.
Cychla pelagica, *Bl. Schn.* p. 341 (not syn.).
Coryphæna pelagica, *Risso, Hist. Nat.* iii. p. 340; *Bonap. Faun. Ital. Pesci,* cum fig.
—— azorica, *Cuv. & Val.* ix. p. 306.
Lampugus siculus, *Cuv. & Val.* ix. p. 323. pl. 268.

D. 54. A. 25. Vert. 30.

The height of the body equals the length of the head, and is nearly one-fifth of the total (without caudal). The origin of the anal falls vertically below the middle of the total length (without caudal). Greyish-silvery, sometimes with a dorsal series of large black spots.

Mediterranean; Azores.

3. **Coryphæna scomberoides.**

Lacép. iii. p. 193; *Cuv. & Val.* ix. p. 315; *Bleek. Act. Soc. Sc. Indo-Nederl.* iii. *Celebes,* p. 7.

B. 7. D. 59–60. A. 28–29.

The height of the body equals the length of the head, and is one-sixth of the total (the caudal included). The upper maxillary reaches to below the posterior half of the eye. The length of the pectoral is 8½ in the total. Coloration uniform.

Sea of Macassar (Pacific).

4. **Coryphæna equisetis.**

Barbot, Collect. of Voy. & Trav. v. pl. 29.
Coryphæna equisetis, *L. Syst.* p. 446; *Osbeck, Reise nach China,* p. 404; *Cuv. & Val.* ix. p. 297. pl. 267; *Webb & Berthel. Iles. Canar. Poiss.* p. 58. pl. 21; *Lowe, Trans. Zool. Soc.* iii. p. 7; and *Fishes of Madeira,* p. 67. pl. 10.

D. 53–58. A. 27. Vert. $\frac{13-14}{20-19}$.

The height of the body is 3¾ in the total length (without caudal), the length of the head nearly five times. The maxillary reaches nearly to the vertical from the centre of the eye. Dried specimens do not exhibit any spots on the lower part of the side, or the spots are small and indistinct.

Atlantic; Mediterranean.

a, b. Twenty-seven inches long: stuffed. Atlantic. From Sir A. Smith's Collection.

c, d. Young.

5. Coryphæna punctulata.

Lampugus punctulatus, *Cuv. & Val.* ix. p. 327; ? *Dekay, Faun. New York, Fishes*, p. 134. pl. 11. fig. 31.
? Sarda immaculata, *Gronov. Syst. ed. Gray*, p. 120 (not syn.).

D. 51. A. 25.

The height of the body is nearly equal to the length of the head, and one-fourth of the total (without caudal). The ten or twelve posterior rays of the dorsal and anal fins have their extremities dilated and projecting beyond the membrane, by which they are connected at the base. Silvery, darker on the back, with scattered black dots. (*Cuv.*)

Tropical parts of the Atlantic. (? Latitude of New York.)

6. Coryphæna neapolitana.

Lampugus neapolitanus, *Cuv. & Val.* ix. p. 325.

D. 44. A. 23.

The height of the body is one-fifth of the total length (the caudal included). Back lead-coloured, with a series of blue spots. (*Cuv.*)

Mediterranean (Naples).

22. BRAMA.

Brama, (*Schneid.*) *Risso, Eur. Mérid.* iii. p. 433: *Cuv. & Val.* vii. p. 281.

Body compressed and more or less elevated, covered with rather small scales; cleft of the mouth very oblique, with the lower jaw longest. Dorsal and anal fins elongate, the former with three or four, the latter with two or three spines; caudal deeply forked; ventrals thoracic, with one spine and five rays. The jaws with an outer series of stronger teeth; the teeth of the palatine bones and of the vomer are easily lost. Opercles entire. Seven branchiostegals; air-bladder none. Pyloric appendages in small number.

Mediterranean; Atlantic coasts of Europe and Africa; Indian Ocean; Australia.

1. Brama raii.

Brama marina, *Ray, Synops.* p. 115; *Willughby*, tab. 5. f. 12.
Duhamel, Pêches, iii. p. 26. pl. 6. f. 1; *Pennant, Brit. Zool.* iii. pl. 43.
Sparus raji, *Bl.* taf. 273; *Donov. Brit. Fishes*, ii. pl. 37; *Shaw, Zool.* iv. p. 404.
Brama raii, *Bl. Schn.* p. 99; *Risso, Ichth. Nice*, p. 248, and *Eur. Mérid.* iii. p. 433; *Cuv. & Val.* vii. p. 210. pl. 190; *Parn. Fishes Frith of Forth*, p. 49; *Yarrell, Brit. Fishes*, 2nd edit. i. p. 133, 3rd edit. ii. p. 165; *Lowe, Trans. Zool. Soc.* iii. p. 8; *Guichen. Explor. Algér. Poiss.* p. 56.
Sparus castaneola, *Lacép.* iv. p. 110; *Shaw, Zool.* iv. p. 424.
—— niger, *Turton, Brit. Faun.* p. 98.
? Chætodon, sp., *Couch. Trans. Linn. Soc.* xiv. p. 78.
Skeleton: *Rosenth. Ichthyot. Tafeln.* taf. 12. f. 1.

D. $\frac{3}{30-33}$. A. $\frac{2}{27}$. L. lat. 80-95. L. transv. 13/23. Cæc. pylor. 5. Vert. $\frac{16}{26}$.

The greatest height of the body is below the origin of the dorsal.

and one-third of the total length; the eye is situated in the centre of the head; the pectorals reach to the middle of the anal fin. Coloration uniform.

Mediterranean; English coasts; Cape Seas.

a. Adult: stuffed. Cape Seas.
b. Half-grown: stuffed. Madeira. From the Collection of the Rev. R. T. Lowe.
c. Adult: stuffed. Mediterranean.
d, *e*. Adult: stuffed. English coast.
f. Adult: stuffed. Berwick-on-Tweed. Presented by Dr. Johnston.
g. Adult: stuffed. From Mr. Yarrell's Collection.
h. Half-grown. From the Haslar Collection.

It is impossible to discover specific differences between *Brama raii* and *Brama chilensis* (Gay, Chile, Peces, p. 218) in the accounts given. A remarkable instance of the careless manner in which Valenciennes used to treat ichthyological subjects may be found in *Cuv. Règne Anim. Ill. Poiss.* pl. 44. f. 1, where the very same fish, which he had received from Gay, is marked and figured as *Brama australis*, and described as "assez semblable à celle des mers du *Pôle Arctique*" (viz. *Brama raii*).

2. **Brama dussumieri.**

Cuv. & Val. vii. p. 294.

$$D. \frac{3}{29}. \quad A. \frac{3}{21-25}.$$

The greatest height of the body is below the middle of the back, and one-half of the length (without caudal fin); the eye is situated near the upper outline of the head. Uniform silvery.

Indian Ocean (85° E. long., 0° lat.).

a. Young. China Sea. Presented by Capt. Sir E. Belcher, C.B.

Have young specimens of *Brama raii* the body more elevated, and the eye nearer to the upper profile of the head, than mature ones?

3. **Brama orcini.**

Cuv. & Val. vii. p. 295.

$$D. \frac{3}{27}. \quad A. \frac{3}{24}.$$

The greatest height of the body is before the middle of the back, and $1\frac{1}{2}$ in the length (without caudal); the eye is situated above the middle of the head. Uniform silvery.

Indian Ocean (0° lat., 85° E. long.).

a–c. Lat. 1° N., long. 19° W. Young: taken from the stomach of a dolphin. From the Collection of the Zoological Society.
d. Young: taken from the stomach of a fish. Presented by the College of Surgeons.

4. Brama longipinnis.

Lowe, Proc. Zool. Soc. 1843, p. 82.

B. 7. D. $\frac{4}{31}$. A. $\frac{2}{26}$. L. lat. 41–45.

The height of the body, at the origin of the dorsal and anal fins, is contained twice and one-fifth in the total length; the scales posteriorly, towards the tail, provided with a hook, which is directed forwards; dorsal and anal fins anteriorly produced and falciform. (*Lowe.*)

Sea of Madeira.—The single individual observed measured $18\frac{1}{4}$ inches in length.

23. TARACTES.

Taractes, *Lowe, Proc. Zool. Soc.* 1843, p. 82.

Body ovate and compressed, covered with large scales, which are provided with a hook directed backwards; snout very short, cleft of the mouth subvertical. Dorsal and anal fins broad, with all the rays articulated; caudal rounded; ventrals subjugular. The jaws with an outer series of stronger teeth; teeth on the vomer and on the palatine bones. Præoperculum with strong spines; sub- and interoperculum denticulated. Branchiostegals seven.

Sea of Madeira.

1. Taractes asper.

Lowe, l.c. p. 83.

D. 33. A. 23. V. 1/5. L. lat. 43.

Plain-coloured. (*Lowe.*)

Sea of Madeira.

24. PTERACLIS*.

Pteraclis, *Gronov. Act. Helvet.* vii. p. 44; *Cuv. & Val.* ix. p. 359.

Body compressed, oblong, covered with scales of moderate size; snout obtuse, convex, compressed; cleft of the mouth wide, oblique; eye large. Dorsal elevated, extending from the forehead to the caudal, and composed of filiform, unarticulated spines; anal similar to the dorsal in form and structure. Ventrals jugular, formed by four (six) slender rays. Small teeth in the jaws, on the vomer and the palatine bones. Branchiostegals seven; pseudobranchiæ; airbladder very small. Pyloric appendages in small number.

Indian Ocean; coast of Carolina; Sea of Madeira.

1. Pteraclis papilio.

Lowe, Proc. Zool. Soc. 1843, p. 83.

D. 35 | 6. A. 35. V. 6.

The height of the body is somewhat less than one-fourth of the total length; the fourth spine of the dorsal fin and the second of the anal fin stronger than the others. Head and body silvery-white; the first dorsal and the anal deep violet-blue, with short gold and green iridescent stripes between the rays.

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* 1. Pteraclis trichipterus, *Cuv. & Val.* ix. p. 367.—*Hab.* ——?

Sea of Madeira.

a. Old Collection, as *Coryphæna velifera.*

Lowe has observed in fresh examples, that the hindmost part of the dorsal fin is detached from the rest, and that the ventral fins are composed of six rays. Unfortunately, both those parts, being of an extremely delicate structure, are nearly entirely destroyed in the specimen in the British Museum Collection.

2. Pteraclis ocellatus.

Cuv. & Val. ix. p. 363. pl. 271; *Cuv. Règne Anim. Ill. Poiss.* pl. 66. f. 2.

B. 7. D. 45–46. A. 42. V. 4. L. lat. 50–54. L. transv. 17.

The height of the body is $3\frac{1}{4}$ in the total length, the length of the head four times. Silvery; the dorsal fin with a blue spot at the top.

Canal of Mozambique.

3. Pteraclis carolinus.

Cuv. & Val. ix. p. 368.

D. 52. A. 44. Cæc. pylor. 6.

Silvery. (*Cuv.*)

Coast of Carolina.

4. Pteraclis velifer.

Pteraclis, sp., *Gronov. l. c.* tab. 11. f. 1.
Coryphæna velifera, *Pall. Spicil.* viii. p. 19. tab. 3. f. 1.
Pteraclis velifera, *Bl. Schn.* p. 143. tab. 35 (not good).
Oligopodus veliferus, *Lacép.* ii. pp. 511, 512.
Pteraclis guttatus, *Cuv. & Val.* ix. p. 370.
—— pinnata, *Gronov. Syst. ed. Gray,* p. 170.

B. 7. D. 55. A. 51.

Silvery; the vertical fins brown, with whitish spots. (*Pall.*)

Indian Ocean.

25. SCHEDOPHILUS.

Schedophilus, *Cocco in Giorn. Innom. Mess. Ann.* iii.
Crius, sp., *Valenc. in Webb & Berthel. Iles Canar. Poiss.* p. 45.

Body compressed, oblong, covered with minute scales; cleft of the mouth of moderate width, with the jaws equal; eye moderate; præopercular margin spiny. One dorsal, commencing behind the nape of the neck, formed by flexible spines and branched rays, extending nearly along the whole back; anal similar to the dorsal, but much shorter. Ventrals thoracic (subjugular in *Sch. maculatus*), formed by one spine and five rays. A series of small teeth in the jaws; palate smooth. Branchiostegals seven; pseudobranchiæ; air-bladder (?).

Mediterranean, and the neighbouring parts of the Atlantic; Chinese Sea.

1. Schedophilus berthelotii.

Crius* berthelotii, *Valenc. in Webb & Berthel. Iles Canar. Poiss.* p. 45. pl. 9. f. 1.

D. 38. A. 25. Cæc. pylor. 6.

The height of the body is one-third of the total length. Greenish; fins brownish.

Canary Islands.

a. Half-grown: skin. From Gronow's Collection.

2. Schedophilus maculatus.

D. $\frac{9}{27}$. A. $\frac{3}{24}$. V. 1/5.

The height of the body is contained three times and three-sevenths in the total length. The root of the ventral falls vertically before that of the pectoral. Body and tail spotted with brown; four spots on the base of the dorsal fin, three on that of the anal, two on that of the caudal brownish-black.

Sea of China.

a. Young. China Sea. Presented by Captain Sir E. Belcher, C.B.

The anterior nine dorsal rays and three of the anal fin are decidedly spinous, but I doubt whether this character is preserved in a mature state of the fish. The whole margin of the præoperculum is armed with spines. The ventrals are inserted before the pectorals, subjugular.

Total length	24 lines.
Height of the body	7 ,,

3. Schedophilus medusophagus.

Centrolophus medusophagus, *Cocco in Giorn. Innom. Mess. Ann.* iii. no. 7. p. 57.

Schedophilus medusophagus, *Cocco, l. c.*: *Bonap. Faun. Ital. Pesc.* cum fig.

D. 44–47. A. 28–29. V. 1/5.

The height of the body is one-third of the total length; root of the ventral situated vertically below that of the pectoral. Brown-spotted; fins blackish-brown; caudal without spots at its base.

Mediterranean.

a, *b*. Old Collection.

c, *d*. Young. Open sea. Presented by Capt. J. B. Godfrey.

e. Young. Open sea. Presented by Capt. J. B. Godfrey.

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* Valenciennes has established a genus *Crius* for two fishes, *Crius bennettii* and *Crius berthelotii*.

1. He was aware that Lowe had, previously to him, considered the former as the type of a genus, *Leirus*; nevertheless he has preferred to create a synonym.

2. He has no recollection that *Crius bennettii* is described in the *Histoire Nat. des Poiss.* as *Centrolophus ovalis*.

3. He characterizes the genus *Crius* as having a spineless præoperculum, whilst one of the species (*Cr. berthelotii*) is distinguished by very prominent præopercular spines

26. DIANA.

Diana, *Risso, Eur. Mérid.* iii. p. 267.
Astrodermus, (*Bonelli*) *Cuv. & Val.* ix. p. 352.

Body compressed, oblong, covered with minute granular scales; cleft of the mouth very narrow; head with a high interparietal crest. A single dorsal, which, like the anal, is composed of unarticulated, flexible, widely-set spines; ventrals slender, elongate. A single series of minute teeth in the jaws; teeth on the palatine bones and on the tongue. Branchiostegals five; air-bladder none? Pyloric appendages in small number; intestines with many circumvolutions.

Mediterranean.

1. Diana semilunata.

Diana semilunata, *Risso, l. c.* tab. 7. f. 4.
Astrodermus coryphænoides, (*Bonelli*) *Cuv. & Val.* ix. p. 353. pl. 270 (bad); *Lowe, Proc. Zool. Soc.* 1840, p. 37, and *Trans. Zool. Soc.* iii. p. 7.
Diana valenciennesii, *Cocco, Giorn. Sc. Lett. Art. Sic.* F. 173. cum fig.
Astroderma plumbeum, *Lowe, Proc. Zool. Soc.* 1843, p. 83.
Astrodermus elegans, *Bonap. Faun. Ital. Pesc.* cum fig.

B. 5. D. 22–23. A. 18. V. 2/5. Cæc. pylor. 5.

Palate with two membranaceous folds, one behind the intermaxillary teeth, and the other across the vomer. Ventral spines serrated. Silvery, with blackish spots; dorsal and anal fins bluish-black, the other fins reddish-yellow.

Mediterranean; Sea of Madeira.

The description and figure of *Astrodermus elegans*, given by Bonaparte, agree so closely with the characters attributed to *Astroderma plumbeum* by Mr. Lowe, that I do not hesitate to consider both as identical. Bonaparte says, that the figure given by Cuvier is merely a bad representation of the same fish. There is, however, one discrepancy between Lowe's and Bonaparte's accounts: the individual examined by the former, and four inches long, had the ventral spine feeble and not serrated, whilst a serrature is distinct in Bonaparte's and Cuvier's specimens, which measured from seven to fifteen inches in length. Whether this is really a specific difference I cannot say.

27. AUSONIA.

Ausonia, *Risso, Eur. Mérid.* iii. p. 341.
Proctostegus, *Nardo.*

Body oblong, much compressed and attenuated towards the tail, encrusted with patches of minute, soft, deciduous, branny scales; cleft of the mouth small, narrow. One dorsal, occupying the posterior half of the back, composed of unarticulated rays, and with a single detached spine in front; caudal forked; ventrals thoracic, rudimentary; vent immediately behind, and closed by, the ventrals. Teeth in a single row, minute, finely pectinate; a longitudinal keel on each side of the tail. Branchiostegals five; air-bladder large; pyloric appendages five.

Mediterranean; Sea of Madeira.

1. Ausonia cuvieri.

Ausonia cuvieri, *Risso, l. c.* p. 342. fig. 28; *Lowe, Proc. Zool. Soc.* 1843, p. 84.

Luvarus imperialis, (*Rafinesque*) *Cuv. & Val.* ix. p. 412.

Proctostegus proctostegus, *Nardo, Prodromus Observ. et Disq., Adriat. Ichth. in Diar. Phys. Chem. et Hist. Nat. Ticini,* 1827, vol. i. pp. 18 & 42.

—— prototypus, *Nardo, Mem. "De Proctostego," Patavii,* 1827 (with a good figure).

D. 1 | 13. A. 1 | 14. V. 1 or 1/4.

The height of the body is contained three times and a half in the total length.

Mediterranean; Sea of Madeira.

This species is extremely scarce, and very little known. There are, moreover, several important discrepancies between the descriptions, and it is not yet evident whether they have originated in imperfect means of observation, or whether they depend on different states of age, or whether we have hitherto confounded different species. I think it my duty, therefore, to give in full the account, for which I am indebted to the Rev. R. T. Lowe, and which he had taken from a fresh and perfect individual; this specimen, deposited in the former Museum of the Zoological Society, appears to have been lost.

"The whole body is smooth and naked, with the exception of irregular patches here and there (most plentifully on the head and back) of a skinny, crape-like coat or covering of minute, rough, branny scales, like a crust of half-congealed snow, and easily rubbing off. This has once evidently covered the whole fish, the nakedness being the result of either natural wear or injury. The mouth is singularly small, and as it were subtubular, yet quite short, and not protractile. Maxillary very broad and short. *Teeth* in a single row in both jaws, pectinate, and excessively fine and minute, but *perfectly distinct.* Palatines with a rough, narrow band; tongue smooth; œsophagus verrucose, and furnished besides with large soft papillæ.

"Close before the dorsal fin is a rather short spine seated in a groove, in which, when reclined, it lies quite concealed; it is webbed behind in its axil, but perfectly free from the dorsal fin; the first two rays are decidedly spinous, the next five or six somewhat horny and subpungent, and the rest feebly branched, much as in *Lampris*...... The ventral fins are reduced to two short, bony, triangular-prismatic spines (one inch long), placed close to each other on the ventral keel, under the fore-axil of the pectoral fins, at the fore-edge of the vent, which, when reclined, they cover and conceal, closing over it like a pair of folding-doors. I could not discover the least trace or rudiment of other rays.

"The colour is a uniform iridescent pale steel or lead, reflecting rosy, lilac or purple tints towards the back; silvery towards the belly and about the head. The dorsal and anal fins have the membrane black and the rays vermilion; pectoral and caudal fins wholly bright vermilion; ventrals flesh-coloured, the spine in front of the dorsal and anal fins whitish. The patches of the crust of the body are of a pale pink or dirty-white tint. Inside of the mouth purplish or dark mulberry-red."

	inches.	lines.
Total length	35	$4\frac{1}{2}$
Length of the head	7	$1\frac{1}{2}$
Diameter of the eye	1	0
Height of the body	10	3
Thickness of the body	3	$1\frac{1}{2}$
Length of the pectoral fin	7	6
——— of the ventral fin	1	0

28. MENE.

Mene, *Lacep.* v. p. 479; *Cuv. & Val.* x. p. 103.

Body much compressed, with prominent and trenchant abdomen, naked; mouth very protractile; teeth in the jaws villiform, none on the palate. A single long dorsal, without distinct spinous portion; anal without spines, and with the rays enveloped in the skin, their free extremities being very broad; ventrals with one spine and five soft rays. Branchiostegals seven; air-bladder large, bifurcate posteriorly. Pyloric appendages in increased number.

East Indian Seas.

1. Mene maculata.

Zeus maculatus, *Bl. Schn.* p. 95. pl. 22.
Mene anna carolina, *Lacep.* v. pp. 479, 480. pl. 14. f. 2
Russell, i. p. 47. pl. 60.
Mene maculata, *Cuv. & Val.* x. p. 104. pl. 285; *Faun. Japon. Poiss.* p. 127. pl. 67. f. 3; *Richards. Ichth. Chin.* p. 276; *Cant. Catal.* p. 154; *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 86; *Cuv. Règne Anim. Ill. Poiss.* pl. 62. f. 2.

B. 7. D. $\frac{3-4}{40-41}$. A. 30–32. V. 1/5. Cæc. pylor. 25–30.

The first ventral ray very elongate. The upper profile is nearly horizontal, whilst the lower is nearly semicircular. The upper part of the sides with series of lead-coloured spots.

East Indian Seas.

a. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.

b. Adult: dried. From the Collection of the Zoological Society.

c. Adult.

Young age or distinct species? Dorsal fin with nine spines, anal with two; the rays of the latter do not show any peculiarity.

d. One inch long. Open sea. Presented by J. B. Godfrey, Esq.

29. LAMPRIS.

Lampris, *Retzius in Nya Handl.* 1799, pt. iii. p. 91; *Cuv. Règne Anim.*
Chrysotosus, *Lacép.* iv. p. 586.

Body compressed and elevated, covered with very small deciduous scales; cleft of the mouth narrow. A single dorsal fin without a spinous portion; no distinct anal spines; ventrals composed of many rays. Teeth none. Branchiostegals six; air-bladder large, posteriorly bifurcate. Pyloric appendages in very great number.

Northern parts of the Atlantic; Mediterranean.

1. Lampris luna.

Sibbald, Scotia Illustr. pl. 6. f. 3 (bad); *Mortimer, Philos. Trans.* xlvi. p. 518. tab. 4; *Stroem, Sændmer,* i. p. 323. tab. 1. f. 20; *Müll. Prodr. Zool. Dan.* p. 44. no. 370.

Opah sive Zeus opah, *Penn. Arct. Zool. Suppl.* p. 119, and *Brit. Zool.* iii. p. 223. pl. 42, and edit. 1812, iii. p. 299. pl. 46; *Sowerby, Brit. Misc.* pl. 22.

Poisson lune, *Duhamel, Pêches,* iii. p. 74. tab. 17.

Scomber pelagicus, *Gunner in Dronth. Selsk. Skr.* iv. p. 80. taf. 12. f. 1 (not good).

Zeus luna, *L. Gm.* i. p. 1225; *Bl. Schn.* p. 96; *Donov. Brit. Fishes,* v. pl. 97.

—— guttatus, *Brünn. in Danske Selsk. Skr. Ny. Udg.* 1788, iii. p. 398. tab. A; *Holten in Naturh. Selsk. Skr.* v. p. 129; *Faber, Fische Islands,* p. 132.

Lampris guttatus, *Retzius, l. c.*; *Holten in Zool. Dan.* iv. tab. 144; *Cuv. & Val.* x. p. 39. pl. 282; *Cuv. Règne Anim. Ill. Poiss.* pl. 61. f. 1; *Yarrell, Brit. Fishes,* i. p. 194; *Parn. Fishes Frith of Forth,* p. 63. pl. 27; *Gaim. Voy. en Islande et au Groënl. Zool. Poiss.* pl. 10.

Scomber gunneri, *Bl. Schn.* p. 38.

Chrysotosus luna, *Lacép.* iv. p. 586. pl. 9. f. 3.

Zeus imperialis, *Shaw, Nat. Misc.* iv. pl. 140, and *Zool.* iv. p. 289. pl. 42.

Lampris luna, *Risso, Eur. Mérid.* iii. p. 341.

Zeus guttatus, *Richards. Faun. Bor. Amer. Fishes,* p. 83.

? Lampris lauta, *Lowe, Trans. Zool. Soc.* ii. p. 183, iii. p. 6, and *Proc. Zool. Soc.* 1839, p. 80, and *Fishes of Madeira,* p. 27. tab. 5.

Skeleton: *Bakker, Osteogr. Pisc.*

B. 6. D. 53–55. A. 38–41. V. 14–16. Vert. 20/23 or 23/22 or 24/21. (*Lowe.*)

The anterior part of the dorsal is produced into a more or less long point; anal low. Body with numerous white spots; fins red.

Northern parts of the Atlantic; Mediterranean.

a. Three feet long: stuffed. Coast of Devonshire.

I am unable to come to a decided opinion respecting the differences between the description of Cuvier and the most elaborate account of Mr. Lowe. They may very well fall within the limits of individual variation in a species of so large a size as *Lampris.* Cuvier, however, speaks of seven branchiostegals, whilst *all the other* observers have found only six. The difference in locality cannot be considered as of great value: the northern *Scomber scomber* is the same as the southern. The single stuffed specimen in the British Museum does not give any additional light; it appears to agree better with Mr. Lowe's description than with Cuvier's.

Fam. 17. CARANGIDÆ.

Scomberoidei, pt., et Squamipinnes, pt., *Cuv. Règne Anim.*; *Müller, Berl. Abhandl.* 1844, p. 201; *Owen, Lect. on Compar. Anat. Vert.* i. p. 49.

Body generally compressed, oblong or elevated, covered with small scales or naked; eye lateral. Dentition variable. The infraorbital bones do not articulate with the præoperculum. The spinous dorsal less developed than the soft or than the anal, either continuous with, or separated from, the soft portion, sometimes rudimentary†. The posterior rays of the dorsal and anal fins sometimes semidetached. Ventrals thoracic, sometimes rudimentary or entirely absent. No prominent papilla near the vent. Gill-opening wide; generally seven branchiostegals and pseudobranchiæ‡; air-bladder present; pyloric appendages generally in great number§. Vertebræ 10/14.

Inhabitants of the seas of the temperate and tropical regions, many of the species having a very wide range.

This family forms a very natural division, widely differing from the *Scombridæ* in the structure of the vertebral column, which is composed of ten abdominal and fourteen caudal vertebræ. The only exception is found in the genera *Chorinemus* and *Temnodon*, where the number of the vertebræ is increased by one or two: but a comparison with *Lichia* shows that their natural position is by the side of this genus. Several authors have also distinguished a family of *Carangidæ*; but if they have defined it at all, they have applied characters very different from those given above, and have not paid attention to the structure of the skeleton.

I divide this family into two groups:—

The soft dorsal and anal of nearly equal extent .. A. **Carangina.**
One dorsal fin only, much shorter than the anal .. B. **Kurtina.**

Synopsis of the Genera.

First group: **Carangina.**

a. Two anal spines remote from the soft portion.

* Lateral line with plate-like shields, each of which is generally armed with a spine.

Lateral line entirely shielded .... 1. TRACHURUS.

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† A single short dorsal in the second group.
‡ Absent in *Lichia* and *Trachynotus*.
§ In small number in *Equula* and *Lactarius*.

Lateral line partly smooth; præoperculum denticulated	2. Carangichthys.
Lateral line partly smooth; præoperculum entire	3. Caranx.

** Lateral line smooth. The spines of the first dorsal connected by a membrane.

Body and præorbital very elevated; the spinous dorsal and the anal spines sometimes rudimentary	4. Argyreiosus.
Præorbital of moderate height; abdomen trenchant.	5. Micropteryx.
Præorbital of moderate height; abdomen rounded; teeth villiform; præoperculum entire; finlets none.	6. Seriola.
Præorbital of moderate height; præoperculum denticulated; cleft of the mouth moderately wide; teeth of the jaws in a single series, rather small	7. Seriolella
A finlet behind the dorsal and anal fins	8. Seriolichthys.
Cleft of the mouth narrow; teeth of the jaws in villiform bands; præoperculum armed at the angle	9. Naucleрus.
Body naked; cleft of the mouth wide; præoperculum serrated; finlets none	10. Porthmeus.
Jaws with a series of strong teeth	11. Temnodon.

*** The spinous dorsal formed by isolated spines in small number.

The posterior rays of the dorsal and anal fins semidetached, forming finlets; dermal productions lanceolate	12. Chorinemus.
Finlets none; forehead not prominent; scales minute, rounded	13. Lichia.
Finlets none; forehead prominent; scales very small, rounded; ventrals 1/5; opercles entire	14. Trachynotus.
Forehead prominent; præ- sub- and interoperculum serrated	15. Pammelas.
Ventrals none	16. Paropsis

β. Anal spines continuous with the soft portion, if present.

Ventrals rudimentary	17. Psettus.
Ventrals well developed; dorsal spines nearly entirely hidden	18. Platax.
The third dorsal spine very elongate	19. Zanclus.
Two dorsals; forehead swollen; jaws with a series of small teeth	20. Psenes.
Mouth very protractile; scales spiny	21. Capros.
Mouth little protractile; scales spiny	22. Antigonia.
Mouth very protractile: scales cycloid; all the teeth equal and very small	23. Equula.
Mouth very protractile; upper jaw with a pair of canines; the lower præopercular margin serrated.	24. Gazza.
One or two pairs of strong canines; præopercular margins entire	25. Lactarius.

Second group: Kurtina.

Scales of moderate size	26. Pempheris.
Scales exceedingly small	27. Kurtus.

First Group. CARANGINA.

Carangidæ with the soft dorsal and anal of nearly equal extent.

1. TRACHURUS.

Trachurus, *Cuv. & Val.* ix. p. 6.

Body slightly compressed, oblong, covered with very small scales; the lateral line with a band of high plates from the origin to the end, each plate with a curved spine. Cleft of the mouth moderate, snout rather extended. Two dorsals; the first less developed than the second, with eight spines and with a horizontal anterior spine, directed forwards. Two anal spines, separated from the soft portion; finlets none. Minute teeth in the jaws, on the vomer and on the palatines. Seven branchiostegals; pseudobranchiæ present; air-bladder bifurcate posteriorly. Pyloric appendages in increased number.

Coasts of Europe and Africa; East Indian and Australian Seas; temperate parts of the Pacific.

1. Trachurus trachurus.

The Horse-Mackarel.
Τραχοῦρος, *Athen.* vii. 326; *Oppian, Halieut.* i. p. 5.
Saurus, *Salvian.* fol. 79.
Lacertus s. Trachurus, *Bellon.* p. 133; *Gesner*, pp. 467, 552.
Trachurus, *Rondel.* viii. c. 6. p. 233; *Schonev.* p. 75; *Aldrov.* ii. c. 52. p. 268; *Jonston*, i. tit. 3. cap. 3. art. 1. tab. 21. f. 8; *Willughby*, p. 290. tab. S. 22; *Ray*, p. 92.
Scomber, no. 3, *Artedi, Genera*, p. 31.
—— trachurus, *L. Syst. Nat.* i. p. 494; *Bl.* taf. 56; *Bl. Schn.* p. 27; *Pall. Zoogr. Ross.* iii. p. 218; *Donov. Brit. Fishes*, i. pl. 3.
—— sp., *Gronov. Zoophyl.* no. 308, and *Mus. Ichth.* i. p. 34. no. 80; *Duhamel, Pêches*, ii. sect. 7. p. 189; *Pennant, Brit. Zool.* iii. p. 237. pl. 51.
Caranx trachurus, *Lacép.* iii. p. 63; *Risso, Ichth. Nice*, p. 173, and *Eur. Mérid.* iii. p. 421; *Cuv. & Val.* ix. p. 11. pl. 246; *Parn. Fishes Frith of Forth*, p. 57; *Yarrell, Brit. Fishes*, i. p. 175; *Gay, Hist. Chile, Zool.* ii. p. 233; *Cuv. Règne Anim. Ill. Poiss.* pl. 57. f. 1; *Richards. Ichth. Chin.* p. 273, and *Ann. & Mag. Nat. Hist.* 1843, xi. p. 25; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 393; *Guichen. Explor. Algér. Poiss.* p. 61.
Caranxomorus, *Lacép.* iii. pl. 11. f. 1 (according to *Cuv.*).
Caranx amia, *Risso, Ichth. Nice*, p. 174.
Seriola picturata, *Bowd. Exc.* p. 123. f. 27 (very bad).
Trachurus europæus, *Gronov. Syst. ed. Gray*, p. 125.
Caranx trachurus japonicus, *Schleg. Faun. Japon. Poiss.* p. 109. pl. 59. f. 1.
Selar japonicus, *Bleek. Verh. Bat. Gen.* xxvi. *Japan*, pl. 8. f. 1.
Caranx symmetricus, *Ayres, Proc. Calif. Acad. Nat. Sc.* i. 1855, p. 62.
Trachurus symmetricus, *Girard in U. S. Pacif. R. R. Exped. Fishes*, p. 107.
Caranx cuvieri, *Lowe. Trans. Zool. Soc.* ii. p. 183.

Caranx declivis, *Jenyns, Zool. Beagle, Fishes*, p. 68. pl. 14.
Trachurus trachurus, *Casteln. Anim. nouv. ou rares, Poiss.* p. 23.

$D.\ 8 \left| \frac{1}{31\text{–}33} \right.$. $A.\ 2 \left| \frac{1}{26\text{–}29} \right.$. L. lat. 70–99. Cæc. pylor. 12–20. Vert. 10/14.

The height of the body is $4\frac{1}{2}$ to $5\frac{1}{3}$ in the total length, the length of the head $4\frac{1}{2}$. The snout is longer than the diameter of the eye; the upper maxillary reaches to, or slightly beyond, the vertical from the anterior margin of the eye. A black blotch on the posterior margin of the operculum.

From the coasts of the temperate parts of Europe, along the coasts of Africa, round the Cape of Good Hope, into the East Indian Seas, to the coasts of New Zealand and West America.

a. Fine specimen. English Coast. Purchased.

b. Half-grown: skin. English Coast. From Mr. Yarrell's Collection.

c, d. Adult: stuffed. Frith of Forth.

e. Adult. South Wales. Presented by J. Stokes, Esq.

f. Adult: stuffed. Weymouth. Presented by Lieut. H. F. Spence, R.N.

g, h. Young. Devonshire. Mus. Leach.

i. Adult: stuffed. Mediterranean.

k. Half-grown. Mediterranean.

l. Young. South Europe. Presented by R. B. Webb, Esq.

m. Young: not good state. Sicily. Presented by W. Swainson, Esq.

n. Half-grown. Dalmatia.

o. Very fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.

p. Half-grown. Lisbon.

q. Adult. Madeira. Presented by the Rev. R. T. Lowe.

r. Half-grown. Cape of Good Hope. From the Haslar Collection.

s. Half-grown. Australia. From Mr. Macgillivray's Collection.

t. Half-grown: skin. Australia. From Mr. Gould's Collection

u. Half-grown: skin. Australia. Presented by the Earl of Derby.

v. Half-grown. Australia. Presented by the Earl of Derby.

w. Half-grown. Port Jackson. From Mr. Macgillivray's Collection.
$D.\ 8 \left| \frac{1}{33} \right.$. $A.\ 2 \left| \frac{1}{29} \right.$. L. lat. 75. = *Caranx declivis*, Jen.

x. Young. New Zealand. Presented by Sir J. Richardson.

y. Adult. From the Haslar Collection.

z. Adult: skin. From Mr. Yarrell's Collection.

α. Half-grown. Presented by Dr. Johnston.

β. Adult.

γ. Adult: skin. From Gronov's Collection.

δ. Adult: stuffed.

ε. Young. From the Haslar Collection.

ζ, η. Adult: skins.

θ. Half-grown: skeleton. Port Jackson. From Mr. Macgillivray's Collection.

ι. Adult: skeleton. Purchased.

Skeleton.—There are two skeletons in the British Museum, one from a British, the other from an Australian specimen; they are identical in every point, and prove the correctness of my opinion of the specific unity of *Caranx trachurus*. There are several strong crests on the upper surface of the skull: the occipital crest occupies all the length of the skull, from the anterior extremity of the frontal bones to the occipital joint; a pair of lower crests on each side of the crown, the interior proceeding from the superciliary margin, the exterior from the posterior angle of the orbit. The præfrontals are small, and situated in a depression before the orbit. The basal portion of the brain-capsule is neither compressed nor swollen. The maxillary becomes gradually wider behind, and has a narrow supplementary bone which occupies its whole superior margin. The maxillary is slender, with a triangular prominence behind, and with the posterior processes rather short. The mandibula has a rudimentary muciferous channel, with four pores leading into it; there is a wide free space between the dentary and articular bones. The præoperculum is rounded, with the space between the edge and the flat interior ridge very wide; many irregular pores indicate the presence of a rudimentary channel in its interior; the lower limb is shorter than the posterior. The operculum is nearly twice as high as wide, and has a small notch posteriorly and another superiorly. The interoperculum is larger than the suboperculum.

The turbinal bones are compressed tubes of moderate length; the præorbital is rather narrow, widest anteriorly; the remainder of the infraorbital ring is narrow, but widening behind.

The suprascapula and scapula are feeble; the humerus, with the bones of the fore-arm, forms a deep groove, the bottom of which is nearly completely bony; the radius has a wide ovate foramen. The coracoid is broad, tapering inferiorly. Each of the pubic bones is formed by three narrow lamellæ, and terminates posteriorly in a short and slender process.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·7. Each vertebra has a deep lateral impression. The neural and hæmal spines are moderately long and strong, and inclined backwards; the interneurals and interhæmals are feeble. The hæmal of the first caudal vertebra and the first interhæmal are united to one strong bone, forming the base for the anal spines; it is very slightly curved anteriorly. The ribs are of moderate strength, and have slender epipleural spines.

2. CARANGICHTHYS.

Carangichthys, *Bleeker*, *Celebes*, iii. p. 760.

Body compressed, elevated, covered with very small scales; the posterior portion of the lateral line furnished with plates, each of which is armed with a hook. *Præoperculum denticulated*. Cleft of the mouth moderate; snout short, convex. Two dorsals, the first with eight spines and with an anterior horizontal spine, directed forwards. Two anal spines, separated from the soft portion; finlets none. Teeth in the jaws, on the vomer, the palatines, and on the tongue. Seven branchiostegals.

Sea of Celebes.

1. Carangichthys typus.

Bleeker, l. c.

D. 8 | $\frac{1}{18}$. A. 2 | $\frac{1}{17}$. L. lat. 22.

The teeth in both the jaws are in a band, with an outer series of larger teeth. The height of the body is one-third, the length of the head one-fourth of the total length. The snout is equal in length to the diameter of the eye, the upper maxillary reaching to below the middle of the eye; the jaws are equal anteriorly. Breast scaleless. The lateral line is slightly curved, the straight portion beginning below the middle of the soft dorsal. The second dorsal and anal nearly as elevated as the body, pointed. Opercular spot indistinct. (*Bl.*)

Sea of Celebes.

3. CARANX*

Caranx, Olistus, Scyris, Blepharis, Gallichthys, et Hynnis, *Cuv. & Val.* ix. p. 28, &c.

Megalaspis, Decapterus, Selar, Caranx, Carangoides, Leioglossus, Uraspis, Selaroides (Leptaspis), et Gnathanodon, *Bleeker, Natuurk. Tydschr.* 1855, v. p. 417.

Caranx et Carangus, *Girard, Proc. Acad. Nat. Sc. Philad.* 1858, p. 168.

Body more or less compressed, sometimes subcylindrical; cleft of the mouth moderate. The first dorsal continuous, generally with

[*] 1. Caranx microchir, *Cuv. & Val.* ix. p. 59.—Sunda Sea.
2. —— para, *Cuv. & Val.* ix. p. 58.—Caranx cambon, *Cuv. & Val.* ix. p. 60.—Caranx peronii, *Bleek. Faun. Midd. en Oost-Java* (not *Cuv. & Val.*).—Selar para, *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 56.—East Indian Seas.
3. —— fasciatus, *Cuv. & Val.* ix. p. 70.—Gulf of Mexico.
4. Selar megalaspis, *Bleeker, Sumatra*, iii. p. 502.—Sea of Priaman.
5. Caranx solea, *Cuv. & Val.* ix. p. 86.—Brazil.
6. —— bartholomæi, *Cuv. & Val.* ix. p. 100.—St. Bartholomew's Island.
7. —— mentalis, (*Ehrenb.*) *Cuv. & Val.* ix. p. 124.—Red Sea.
8. —— tille, *Cuv. & Val.* ix. p. 124.—Pondicherry.
9. —— tapeinosoma, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Amboina*, p. 44.—Sea of Amboyna.
10. —— janthinospilos, *Bleek. l. c.* p. 45.—Sea of Amboyna.
11. —— peruanus, *Tschudi, Faun. Peruan. Ichthyol.* p. 19.—Coast of Peru. Description apparently faulty.
12. —— cancroides, *Richards. Ichth. Chin.* p. 274.—Canton.
13. —— bixanthopterus, *Rüpp. N. W. Fische*, p. 49. taf. 14. f. 2.—Red Sea.
14. Scomber heberi, *Benn. Fishes of Ceylon*, no. 26; *Cuv. & Val.* ix. p. 119.—Coast of Ceylon.
15. Trachurus boops, *Girard, U. S. Pacif. R. R. Route, Fishes*, p. 108.—Coast of California. In the description of this species, an account of the teeth has been entirely omitted! The author adopts the genus *Trachurus*, and "distinguishes it from *Caranx* proper by the structure of its lateral line, which is composed of vertical scale-like scutellæ throughout its whole length." The second species of the genus so defined, has "the armature, peculiar to this genus, commencing opposite the anterior margin of the second dorsal fin." (!)
16. Caranx cestus, *Richards. Ichth. Chin.* p. 274.—Sea of China.
17. —— margarita, *Richards. l. c.* p. 276.—Sea of China.
18. —— cœruleopinnatus, *Cuv. & Val.* ix. p. 119 (not *Rüpp.*).—New Guinea.
19. Blepharis fasciatus, *Richards. Ichth. Chin.* p. 271 (not *Rüpp.*).—China. The typical specimen is in the Collection of the Cambridge Philosophical Institution.

eight feeble spines, sometimes rudimentary; a spine directed forwards in front of the spinous dorsal; the second dorsal and anal more developed, sometimes with the posterior rays detached; two anal spines, separated from the soft fin by an interspace (rudimentary in *C. helvolus*). Scales very small; lateral line with an anterior curved and with a posterior straight portion, the latter with large plate-like scales, several of which are generally keeled, the keel ending in a spine. Dentition feeble, more or less complete. Seven branchiostegals; air-bladder simple, bifurcate posteriorly. Pyloric appendages in great number.

Inhabitants of nearly all the temperate and tropical seas.

The genera established by Cuvier, in connexion with *Caranx*, are founded on trivial, and partly erroneous characters. A more scientific division, founded on the dentition, has been introduced by Rüppell, and fully developed by Bleeker, who created names for the single groups. But I am of opinion that those genera are admissible only for convenience' sake, and that it is better not to adopt them; first, because the genera so formed are by no means natural groups, and secondly, because in many species there is a considerable change in the dentition, dependent on age; the separation into distinct genera would therefore lead to manifold errors. This, however, does not apply to the group called *Caranx* by Bleeker, as the dentition of those fishes appears to be very constant, and not liable to variation with age. Leaving all the *Scombridæ* with an armed lateral line (*Trachurus* and *Carangichthys* excepted) in the single genus *Caranx*, I propose the following division:—

I. The soft dorsal and anal with rays detached from the rest of the fin.

A. With eight or nine rays detached (*Megalaspis*, Bleek.), p. 424.

1. C. rottleri.

B. With a single posterior ray detached (*Decapterus*, Bleek.), p. 425.

2. C. macrosoma.
3. C. muroadsi (lajang).
4. C. macarellus.
5. C. punctatus.
6. C. scombrinus.
7. C. jacobæus.
8. C. kurra.
9. C. kurroides.
10. C. kiliche.
11. C. maruadsi (pinnulatus)
12. C. rhonchus.

II. None of the rays detached.

A. The first dorsal developed.

1. None of the rays elongate.

a. The teeth in the jaws are small and of equal size (if present).

α. The height of the body is one-fourth, or less than one-fourth of the total length. Teeth on the palate (*Carangoides*, pt., Bleek. *Selar*, pt., Bleek.), p. 429.

13. C. crumenophthalmus.
14. C. blochii.
15. C. hasseltii.
16. C. torvus.
17. C. gymnostethoides.
18. C. novæ Guineæ.
19. C. boops.

β. The height of the body is more than one-fourth of the total length.

aa. Teeth on the palate (*Carangoides*, pt., *Selar*, pt., and *Leioglossus*, Bleek.), p. 432.

20. C. lioglossus.
21. C. ascensionis.
22. C. djedduba.
23. C. calla.
24. C. macrurus.
25. C. xanthurus.
26. C. malam.
27. C. brevis.
28. C. plagiotænia.
29. C. senegallus.
30. C. ire.
31. C. præustus.
32. C. stellatus.
33. C. malabaricus.
34. C. talamparoides.
35. C. equula.
36. C. hemigymnostethus.
37. C. bajad.
38. C. fulvoguttatus.
39. C. ferdau.
40. C. brockmeyeri.
41. C. chilensis.
42. C. georgianus.

bb. Teeth on the palate none (*Sclaroides*, *Uraspis*, et *Gnathanodon*, Bleek.), p. 440.

43. C. leptolepis.
44. C. dentex.
45. C. amblyrhynchus.
46. C. bicolor.
47. C. helvolus.
48. C. uraspis.
49. C. speciosus.
50. C. rüppellii.

b. The teeth in the upper jaw form a villiform band, with an outer series of stronger ones; those of the lower in a single series (*Caranx*, Bleek.), p. 445.

51. C. fusus.
52. C. chrysos.
53. C. melampygos.
54. C. jarra.
55. C. cynodon.
56. C. lepturus.
57. C. sansun.
58. C. carangus.
59. C. hippos.

2. One or several of the rays of the anal and dorsal fins elongate (*Caranx*, pt., et *Olistus*, Cuv.; *Carangoides*, pt., Bleek.), p. 450.

60. C. atropus.
61. C. ophthalmotænia.
62. C. oblongus.
63. C. chrysophryoides.
64. C. dinema.
65. C. armatus.

B. The first dorsal very little developed, or disappearing with age (*Blepharis*, *Scyris*, *Gallichthys*, et *Hynnis*, Cuv.; *Carangoides*, pt., Bleek.), p. 454.

66. C. ciliaris.
67. C. sutor.
68. C. alexandrinus.
69. C. gallus.
70. C. goreensis.

I. The soft dorsal and anal with rays detached from the rest of the fin.

A. With eight or nine rays detached.

1. Caranx rottleri.

? Scomber cordyla, *L. Syst. Nat.* i. p. 483; *L. Gm.* p. 1332; *Bl. Schn.* p. 23.
Scomber rottleri, *Bl.* x. p. 40. tab. 346; *Bl. Schn.* p. 25; *Shaw, Zool.* iv. p. 598.
Russell, ii. p. 33. pl. 143.
? Scomber guara, *Lacép.* ii. p. 604.
Caranx rottleri, *Rüpp. Atl. Fische*, p. 102, and *N. W. Fische*, p. 48; *Cuv. & Val.* ix. p. 29; *Rüpp. N. W. Fische*, pp. 48, 52; *Richards. Ichth. China*, p. 273; *Cant. Catal.* p. 124.
Megalaspis rottleri, *Bleeker, Verh. Bat. Gen.* xxiv. *Makr.* p. 49.

$$\text{D. } 8 \left| \frac{1}{10\text{–}11} \right| \text{VIII.–IX.} \quad \text{A. } 2 \left| \frac{1}{8} \right| \text{VIII.} \quad \text{Vert. } 10/14.$$

The lateral line makes a short and strong bend above the root of the pectoral, all the rest being straight, and armed with high plates.

The height of the body is $4\frac{2}{5}$ in the total length; the upper profile of the head descends gradually to the end of the snout; the upper maxillary reaches to below the middle of the eye. Operculum with a black spot.

From the Red Sea through all the Indian Seas.

a. Half-grown. China. Presented by J. R. Reeves, Esq.
b. Young. China. Presented by Captain Sir E. Belcher, C.B.
c, *d*. Young. Madras. Presented by T. C. Jerdon, Esq.
e. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.
f. Half-grown. Purchased of M. Parzudaki.
g. Half-grown. Purchased of Mr. Brandt.
h. Half-grown: not good state. Purchased of Mr. Frank.
i, *k*. Young. India.

B. A single posterior ray of the dorsal and anal fins is detached.

2. **Caranx macrosoma.**

Decapterus macrosoma, *Bleek. Natuurk. Tydschr. Nederl. Ind.* i. 1851, p. 358, and *Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 87.

$\text{D. } 8 \left| \frac{1}{33-35} \right| \text{I.} \quad \text{A. } 2 \left| \frac{1}{27-36} \right| \text{I.} \quad \text{L. lat. } 60.$

The teeth of the upper jaw are not perceptible, those of the lower in a single series; vomerine and palatine teeth. The height of the body is $7–6\frac{3}{4}$ in the total length, the length of the head $4\frac{1}{3}–4\frac{1}{2}$. The snout is longer than the eye, the maxillary not reaching to the vertical from the anterior margin of the orbit; the lower jaw is scarcely longer than the upper. Breast scaly; the lateral line very slightly bent. Opercular spot black. (*Bl.*)

Sea of Batavia.

3. **Caranx muroadsi.**

Caranx muroadsi, *Temm. & Schleg. Faun. Japon. Poiss.* p. 108. pl. 58. f. 1.
Decapterus muroadsi, *Bleek. Verh. Bat. Gen.* xxvi. *Japan*, p. 101.
? Decapterus lajang, *Bleeker*, *Ternate*, v. p. 302.

$\text{D. } 8 \left| \frac{1}{31} \right| \text{I.} \quad \text{A. } 2 \left| \frac{1}{26} \right| \text{I.} \quad \text{L. lat. } 28.$

The teeth in the jaws are minute, and form a single series; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $6\frac{1}{2}$ in the total length, the length of the head $4\frac{2}{3}$. The snout is about equal in length to the diameter of the eye, and has the lower jaw a little longer than the upper; the maxillary reaches to, or scarcely to the vertical from the anterior margin of the eye. Breast scaly; the lateral line is very slightly bent, and becomes straight below the tenth dorsal ray. Opercular spot blackish; top of the soft dorsal brown.

Seas of Japan (and Ternate?).

Decapterus lajang, Bleek., appears to be very closely allied to *D.*

muroadsi, the vomer of the former being provided with a longitudinal strip of minute teeth, besides the transverse band, which alone is present in the Japanese species.

4. Caranx macarellus.

? Curvata pinima, *Marcgr.* p. 150 *.
Caranx macarellus, *Cuv. & Val.* ix. p. 40.

D. 8 | $\frac{1}{33}$ | I.   A. 2 | $\frac{1}{27}$ | I.   L. lat. 25.

The height of the body is $6\frac{1}{2}$ in the total length, the length of the head $5\frac{1}{2}$. The lateral line is nearly straight, covered anteriorly with a series of round scales, posteriorly with twenty-five small plates. Opercular spot small. (*Cuv.*)

Pyloric appendages numerous.

Atlantic coasts of Tropical America.

5. Caranx punctatus.

Scomber hippos, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. pl. 5. f. 5, cop. by *Dekay, New York Fauna, Fishes*, p. 122. pl. 73. f. 233 (bad).
Caranx punctatus, *Agass. Spix, Pisc. Bras.* p. 108. tab. 56 *a.* f. 2; *Cuv. & Val.* ix. p. 38.
? Caranx suareus, (*Risso*) *Cuv. & Val.* ix. p. 33.

D. 8 | $\frac{1}{30}$ | I.   A. 2 | $\frac{1}{24}$ | I.   L. lat. 46.

The teeth of the jaws are minute, and form a single series; teeth on the vomer and the palatine bones, none on the tongue. The height of the body is six times in the total length, the length of the head $4\frac{1}{2}$. Breast scaly; the lateral line is a little bent downwards, and becomes straight in the vertical from the eighth dorsal spine; the anterior portion is covered with fifty rather small scales, the posterior with forty-six well-developed plates; there is a series of twelve very distinct pores, visible along the anterior part of the lateral line. The snout has the jaws of equal length; it is pointed, and longer than the diameter of the eye, which equals the width between the orbits; the upper maxillary reaches nearly to the vertical from the anterior margin of the eye. Opercular spot indistinct.

From the West Indies to New York. (Mediterranean?)

a. Half-grown. From the Haslar Collection.

The fish called *Caranx punctatus* by Cuvier, is the same to which this name had been given by M. Agassiz in 1829.

6. Caranx scombrinus.

Valenc. Voy. Vénus, Ichthyol. p. 332. pl. 7. f. 1.

D. 9 | $\frac{1}{27}$ | I.   A. 2 | 23 | I.   L. lat. 42.

The height of the body is six times in the total length, the length of the head $4\frac{1}{4}$. Eye large, its diameter being equal in length to the snout, or $3\frac{1}{3}$ in the length of the head. The lateral line is very slightly bent. (*Val.*)

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* This is quoted by M. Agassiz to *Caranx punctatus*.

Galapagos Islands.

7. **Caranx jacobæus.**

Cuv. & Val. ix. p. 42.

$$\mathrm{D.}\ 8 \left| \frac{1}{34} \right| \mathrm{I.} \quad \mathrm{A.}\ 2 \left| \frac{1}{28} \right| \mathrm{I.} \quad \mathrm{L.\ lat.}\ 23\text{–}24.$$

The height of the body is $5\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{3}$. Teeth imperceptible. The lateral line is nearly straight, covered anteriorly with a series of round scales, posteriorly with twenty-three or twenty-four plates. (*Cuv.*)

Cape Verde Islands.

8. **Caranx kurra.**

? Kurra wodagawah, *Russell,* ii. p. 30. pl. 139.
? Caranx russellii, *Rüpp. Atl. Fische,* p. 99.
? Caranx kurra, *Cuv. & Val.* ix. p. 44.
Decapterus kurra, *Bleeker, Verh. Bat. Gen.* xxiv. *Makr.* p. 50, and *Natuurk. Tydschr. Nederl. Ind.* 1851, i. p. 358.

$$\mathrm{D.}\ 8 \left| \frac{1}{29\text{–}31} \right| \mathrm{I.} \quad \mathrm{A.}\ 2 \left| \frac{1}{25\text{–}26} \right| \mathrm{I.} \quad \mathrm{L.\ lat.}\ 35\text{–}40.$$

The teeth of the jaws are minute, and form a single series; teeth on the vomer and the palatine bones, none on the tongue. The height of the body is contained five times or five times and a half in the total length, the length of the head four times. Breast scaly; the lateral line is a little bent downwards, and the plates become distinct below the middle of the soft dorsal. The snout is longer than the eye, and has the lower jaw longer than the upper; the maxillary does not reach to the vertical from the anterior margin of the eye. Opercular spot distinct.

Sea of Batavia. (Red Sea? Coast of Coromandel?)

a. Half-grown: not good state. Moluccas. Purchased of Mr Frank.

9. **Caranx kurroides.**

Decapterus kurroides, *Bleeker, Amboina,* vi. p. 420.

$$\mathrm{D.}\ 8 \left| \frac{1}{29} \right| \mathrm{I.} \quad \mathrm{A.}\ 2 \left| \frac{1}{23} \right| \mathrm{I.} \quad \mathrm{L.\ lat.}\ 30.$$

The teeth in the jaws form a single series; teeth on the vomer, the palatine bones and the tongue. The height of the body is $5\frac{2}{3}$ in the total length, the length of the head $4\frac{1}{3}$. The snout is equal in length to the diameter of the eye, and has the lower jaw a little longer than the upper; the maxillary reaches to the vertical from the anterior margin of the eye. Breast scaly; the lateral line is very slightly bent, and becomes straight somewhat before the vertical from the middle of the soft dorsal. Opercular spot and axil black. (*Bl.*)

Sea of Amboyna.

10. Caranx kiliche.

Cuv. & Val. ix. p. 43.

D. $8 \left| \frac{1}{27} \right|$ I. A. $2 \left| \frac{1}{25} \right|$ I. L. lat. 30.

The height of the body is contained five times and a half in the total length, the length of the head four times. The lateral line is nearly straight, covered anteriorly with conspicuous round scales, posteriorly with thirty plates. Opercular spot very distinct. (*Cuv.*)

Coast of Pondicherry.

11. Caranx maruadsi.

? Caranx sanctæ Helenæ, *Cuv. & Val.* ix. p. 37.
Caranx maruadsi, *Temm. & Schleg. Faun. Japon. Poiss.* p. 109. pl. 58. f. 2.
Decapterus maruadsi, *Bleeker, Verh. Bat. Gen.* xxvi. *Japan* p. 100.

D. $8 \left| \frac{1}{34} \right|$ I. A. $2 \left| \frac{1}{28} \right|$ I. L. lat. 31–33.

The teeth in the jaws are minute, and form a single series: teeth on the vomer, the palatine bones, and on the tongue. The height of the body is contained five times and a half in the total length, the length of the head five times. The snout is somewhat longer than the eye, the lower jaw a little longer than the upper; the maxillary reaches nearly to the vertical from the anterior margin of the eye. Breast scaly; the lateral line is slightly bent, and becomes straight below the middle of the second dorsal. Opercular spot black; top of the soft dorsal white

Seas of Japan and China.

a. Adult: stuffed. China. Presented by J. R. Reeves, Esq.

Caranx pinnulatus, Eyd. & Soul. Voy. Bonite, Zool. i. p. 165. pl. 3. f. 1, from the Sandwich Islands, appears to be different from *C. maruadsi*, if the backward position of the dorsal fin is a truly natural character.

12. Caranx rhonchus.

Caranx rhonchus, *Geoffr. Descr. Eg. Poiss.* pl. 24. f. 1, 2; *Cuv. & Val.* ix. p. 35; *Guichen. Explor. Algér. Poiss.* p. 62.

D. $8 \left| \frac{1}{28} \right|$ I. A. $2 \left| \frac{1}{24} \right|$ I. L. lat. 26.

The teeth in the jaws form narrow bands. The height of the body equals the length of the head, and is contained four times and a half in the total. The curved portion of the lateral line is nearly parallel to the profile of the back, and covered with small scales. The snout has the jaws of equal length, and is pointed; the upper maxillary reaches nearly to the vertical from the anterior margin of the eye. Opercular spot small; the second dorsal with a black blotch at the top.

Coasts of North Africa, from Alexandria to the coast of Gorea.

II. None of the rays detached.

1. None of the rays elongate.

a. The teeth in the jaws are small and of equal size (if present).

α. The height of the body is one-fourth, or less than one-fourth of the total length. Teeth on the palate.

13. Caranx crumenophthalmus.

Scomber crumenophthalmus, *Bl.* taf. 343.
—— balantiophthalmus, *Bl. Schn.* p. 29.
—— plumieri, *Bl.* taf. 344 (very bad); *Bl. Schn.* p. 30.
Caranx crumenophthalmus, *Lacép.* iv. p. 107; *Cuv. & Val.* ix. p. 62.
—— daubentonii, *Lacép.* iii. pp. 59, 71.
—— plumieri, *Cuv. & Val.* ix. p. 65; *Guichen. Poiss. in Ramon de la Sagra, Hist. Cuba*, p. 110.
—— macrophthalmus, *Agass. Spix, Pisc. Bras.* p. 107. tab. 56 *a.* f. 1.
—— mauritianus, *Quoy & Gaim. Voy. Freyc. Zool.* p. 359; *Cuv. & Val.* ix. p. 60.
—— macrophthalmus, *Rüpp. Atl. Fische*, p. 97. taf. 25. f. 4 (not *Agass.*).

D. $8 \left| \frac{1}{24\text{–}26}\right.$. A. $2 \left| \frac{1}{22\text{–}23}\right.$. L. lat. 36*. Vert. 10/14.

The teeth of the upper jaw form an exceedingly narrow villiform band, those of the lower are in a single series; teeth on the vomer, the palatines and the tongue. The height of the body is $4\frac{1}{2}$ to $4\frac{3}{4}$ in the total length, the length of the head $3\frac{3}{4}$, that of the pectoral four times. Breast scaly; the lateral line is scarcely bent, the scales becoming gradually plate-like somewhat before the middle of the second dorsal. The eye is large, the length of its diameter being $3\frac{1}{5}$ in that of the head, and much more than the width between the eyes. The lower jaw is rather longer than the upper, and the maxillary reaches beyond the vertical from the anterior margin of the eye; the length of the snout equals the diameter of the eye. Opercular spot more or less distinct.

West Africa; Atlantic coasts of Tropical America; Red Sea; Indian Ocean; Polynesia.

α. Atlantic specimens.

a, b. Adult. Puerto Cabello. Purchased of Mr. Brandt.
c. Adult. Puerto Cabello. Purchased of Mr. Brandt.
d, e. Young. S. Domingo. Purchased of Mr. Cuming as *Caranx macrophthalmus.*
f–k. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
l. Young. West Indies. From Mr. Scrivener's Collection.
m, n. Young. Congo Expedition.
o. Half-grown. Niger Expedition. From Mr. Fraser's Collection.
p. Young. West Africa. Presented by Sir A. Smith.
q, r. Young. Gulf of Guinea.

β. Pacific specimens.

s, t. Young. Pearl Islands. Presented by Mr. Stutchbury.

* This number indicates merely the plates.

u. Young. Pearl Islands. Presented by Mr. Stutchbury.

v. Half-grown: stuffed. Aneiteum (New Hebrides). From Mr. Macgillivray's Collection.

w. Adult: bad state. From the Haslar Collection.

x, y. Adult and young. Named *Scomber dimidiatus* (cfr. Cuv. & Val. ix. p. 61).

z, a. Half-grown. From the Collection of the Zoological Society.

14. **Caranx blochii.**

Scomber ruber, *Bloch*, taf. 342; *Bl. Schn.* p. 29.

Caranx blochii, *Cuv. & Val.* ix. p. 69; *Guichen. Poiss. in Ramon de la Sagra, Hist. Cuba*, p. 111.

$$\text{D. } 8 \left| \frac{1}{26}. \quad \text{A. } 2 \right| \frac{1}{22}. \quad \text{L. lat. } 24.$$

The teeth in both the jaws are minute, villiform, arranged in bands. The height of the body is $3\frac{3}{4}$ to 4 in the total length, the length of the head $4\frac{1}{4}$, the length of the pectoral $3\frac{3}{4}$. The lateral line is slightly bent, and becomes straight below the anterior quarter of the dorsal fin. The plates are moderate, distinct from below the middle of the soft dorsal. The lower jaw is slightly prominent; the upper maxillary reaches to the vertical from the anterior margin of the orbit. Opercular spot none.

Atlantic coasts of Tropical America.

a. Twenty-three inches long: skin. West Indies. From Dr. Parnell's Collection.

b–d. Adult: skins. West Indies. From Dr. Parnell's Collection.

e. Young. West Indies. From M. Sallé's Collection.

f. Adult. South America. Presented by Sir R. Schomburgk.

15. **Caranx hasseltii.**

? Caranx affinis, *Rüppell, N. W. Fische*, p. 49. t. 14. f. 1.

Selar hasseltii, *Bleek. Makr.* p. 359, and *Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 53 (not synon.).

$$\text{D. } 7 \left| \frac{1}{25}. \quad \text{A. } 2 \right| 21. \quad \text{L. lat. } 45.$$

The teeth in both the jaws are minute and villiform, *arranged in a narrow band above*, in a single series below; teeth on the vomer, the palatines and the tongue. The height of the body is $4\frac{1}{3}$–$4\frac{1}{2}$ in the total length, and equal to the length of the head; the length of the pectoral is $3\frac{2}{3}$ in the total. The lateral line is very slightly bent, and becomes straight below the anterior quarter of the dorsal fin. The plates are well developed, and become distinct from below the eleventh dorsal ray. The lower jaw projects beyond the upper; the upper maxillary reaches to the vertical from the anterior margin of the orbit. Opercular spot very distinct.

Sunda and Molucca Seas; (Red Sea?).

a. Fine specimen. Amboyna. Purchased of Mr. Frank.

b. Adult. Moluccas.

c. Young: injured.

16. **Caranx torvus.**

Caranx torvus, *Jenyns, Zool. Beagle, Fishes*, p. 69. pl. 15.
Selar torvus, *Bleeker, Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 51.

D. 8 $\big|\frac{1}{26}$. A. 2 $\big|\frac{1}{22}$. L. lat. 35–36.

The teeth of the jaws form a single series; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $4\frac{1}{3}$ to $4\frac{1}{2}$ in the total length, the length of the head $3\frac{2}{3}$; the diameter of the eye is $2\frac{1}{2}$–$2\frac{2}{3}$ in the latter. The upper maxillary reaches beyond the vertical from the anterior margin of the eye; the lower jaw extends beyond the upper. The lateral line is scarcely bent, covered anteriorly with smooth, small, but conspicuous scales, posteriorly with keeled and well-developed plates. Opercular spot none.

Seas of Otaheiti and Batavia.

17. **Caranx gymnostethoides.**

Carangoides gymnostethoides, *Bleek. Makr.* p. 364, and *Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 61.

D. 8 $\big|\frac{1}{31}$. A. 2 $\big|\frac{1}{25}$. L. lat. 25.

The teeth in both the jaws form villiform bands; teeth on the vomer, the palatine bones, and on the tongue. The height of the body equals the length of the head, and is one-fourth of the total; the snout is much longer than the eye, with the jaws equal, and the maxillary does not reach to the vertical from the anterior margin of the eye. Breast naked; the lateral line is slightly bent, and becomes straight below the second third of the soft dorsal. Opercular spot indistinct. (*Bl.*)

Sea of Batavia.

18. **Caranx novæ Guineæ.**

Cuv. & Val. ix. p. 63.

D. 8 $\big|\frac{1}{25}$. A. 2 $\big|\frac{2}{23}$. L. lat. 25–27.

The teeth in the jaws stand in a single series (?). The height of the body is nearly one-fifth of the total length, the length of the head one-fourth; the length of the diameter of the eye is less than one-third of that of the head. The lateral line is very slightly bent, and becomes straight below the anterior third of the soft dorsal. The plates are well developed. The maxillary reaches beyond the vertical from the anterior margin of the eye. Opercular spot none. (*Cuv.*)

Coast of New Guinea.

19. **Caranx boops.**

Caranx boops, *Cuv. & Val.* ix. p. 46.
Selar boops, *Bleeker, Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 51.

D. 8 $\big|\frac{1}{24\text{–}25}$. A. 2 $\big|\frac{1}{20\text{–}21}$. L. lat. 45–48.

The teeth in the jaws form a single series; teeth on the vomer, the palatine bones, and on the tongue. The height of the body equals the length of the head, and is one-fourth of the total. The snout is pointed, and has the lower jaw longer than the upper, the maxillary reaching beyond the vertical from the anterior margin of the eye. Breast scaly; the lateral line is strongly bent anteriorly, and becomes straight before the second dorsal fin; the plates are large, the height of the largest being one-fourth of that of the body. Opercular spot dusky.

Seas of Batavia, Amboyna, and Vanicolo.

β. The height of the body is more than one-fourth of the total length.
aa. Teeth on the palate.

20. Caranx lioglossus.

Leioglossus carangoides, *Bleeker*, *Makr.* p. 367, and *Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 70.

D. $8 \mid \frac{1}{21}$. A. $2 \mid \frac{1}{17}$. L. lat. 25.

The teeth in the jaws are inconspicuous, and form a single series; teeth on the vomer and the palatines, none on the tongue. The first ray of the soft dorsal and anal is produced and filiform. The height of the body is $2\frac{1}{2}$–3 in the total length, the length of the head four times. The lower jaw is longer than the upper; the maxillary reaches to below the middle of the eye. Breast naked; the lateral line is strongly bent, and becomes straight before the vertical from the middle of the dorsal fin. Caudal with the posterior margin black. (*Bl.*)

Sea of Batavia; western coast of Sumatra.

21. Caranx ascensionis.

? Scomber ascensionis, *Osbeck*.
Scomber ascensionis, *Forster*; *Bl. Schn.* p. 33; *Forst. Descr. Anim. ed. Lichtenst.* p. 412.
Caranx ascensionis, *Cuv. & Val.* ix. p. 102. pl. 249.

D. $8 \mid \frac{1}{22}$. A. $2 \mid \frac{1}{18}$. L. lat. 30.

Teeth of the jaws? Teeth on the vomer, the palatines, and on the tongue. A thick, adipose posterior eyelid. The neck is very elevated, and the profile between the eyes concave. The height of the body is contained $2\frac{3}{4}$ times in the total length, the length of the head nearly four times. The lateral line is moderately bent, and becomes straight below the third or fourth dorsal ray. Brown. (*Cuv.*)

Island of Ascension.

22. Caranx djeddaba.

Scomber djeddaba, *Forsk.* p. 56.
Caranx djeddaba, *Rüpp. Atl. Fische*, p. 97. pl. 25. f. 3; *Cuv. & Val.* ix. p. 51.
—— vari, *Cuv. & Val.* ix. p. 48; *Cant. Catal.* p. 125.

D. $8 \mid \frac{1}{24\text{–}26}$. A. $2 \mid \frac{1}{20\text{–}22}$. L. lat. 55–58.

The teeth in the jaws form a single series. The height of the body is $3\frac{2}{3}$ in the total length, the length of the head nearly five times. Breast scaly; the lateral line is strongly curved anteriorly, and becomes straight in the vertical from the third dorsal ray; the plates are well developed, and occupy the whole of the straight portion of the lateral line. The lower jaw extends very slightly beyond the upper, and the maxillary reaches beyond the vertical from the anterior margin of the eye. The upper and lower profiles are nearly equally convex. Opercular spot and anterior dorsal blackish.

Red Sea; coast of Pondicherry; sea of Pinang.

There can be only one objection against uniting *C. vari*, Cuv., with *C. djeddaba*, Forsk. Cuvier says (p. 52),—"La description de Forskål s'y rapporte assez bien, excepté ce qui est dit d'une série unique de dents pointues," from which it would appear that Cuvier has found the teeth arranged in a band in *C. vari*. But he leads us to infer the same of *C. calla*, which is nearly allied to *C. vari*, and, according to my examination, really has the teeth in a single series.

a. Adult: skin. Sea of Pinang. From Dr. Cantor's Collection.

23. **Caranx calla.**

Cuv. & Val. ix. p. 49.

$$\text{D. } 8 \left|\, \frac{1}{23\text{–}24}. \quad \text{A. } 2 \,\right| \frac{1}{19\text{–}20}. \quad \text{L. lat. } 42.$$

The teeth in the jaws form a single series; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $3\frac{1}{2}$ in the total length, the length of the head five times. Breast scaly; the lateral line is strongly curved anteriorly, and becomes straight in the vertical from the third or fifth dorsal ray; the plates are very well developed, and occupy the whole straight portion of the lateral line. The lower jaw extends very slightly beyond the upper, and the maxillary reaches beyond the vertical from the anterior margin of the eye. The lower profile is more convex than the upper. Opercular spot distinct.

Red Sea; Indian Ocean and Archipelago.

a. Fine specimen. Purchased.
b. Young; not good state. Sumatra. Purchased of Mr. Frank.
c. Adult: not good state. Moluccas. Purchased of Mr. Frank.
d. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
e. Half-grown. China.
f. Half-grown. China.
g. Half-grown. China. Presented by J. R. Reeves, Esq.
h. Half-grown. China.
i–n. Young. China.
o. Fine specimen. Amoy (China).
p. Half-grown. From the Collection of the Zoological Society.

24. Caranx macrurus.

Selar macrurus, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 52, and *Java,* iii. p. 359.

D. 8 $\big|\,\frac{1}{24-27}$. A. 2 $\big|\,\frac{1}{20-22}$. L. lat. 60.

The teeth of the jaws form a single series; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is nearly four times in the total length, the length of the head $5\frac{1}{2}$. The snout is pointed, with the lower jaw prominent; the upper maxillary does not reach to the vertical from the anterior margin of the eye. The lateral line is strongly bent anteriorly, and becomes straight below the origin of the second dorsal; the plates are well developed; breast scaly. Opercular spot indistinct; the second dorsal and the caudal with black margins. (*Bleek.*)

Sea of Batavia.

25. Caranx xanthurus.

Caranx xanthurus, (*Kuhl & van Hass.*) *Cuv. & Val.* ix. p. 55.
—— mate, *Cuv. & Val.* ix. p. 54; *Cant. Catal.* p. 125.
Selar kuhlii, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 54, and *Java,* iii. p. 360.

D. 8 $\big|\,\frac{1}{24}$. A. 2 $\big|\,\frac{1}{19}$. L. lat. 40.

The teeth in the jaws form a single series; teeth on the vomer, the palatine bones and the tongue. The height of the body is $3\frac{2}{3}$ in the total length, the length of the head $4\frac{1}{3}$. Breast scaly; the lateral line is moderately bent anteriorly, and becomes straight in the vertical from the sixth dorsal ray; the plates are well developed. The lower jaw is rather longer than the upper, and the maxillary reaches to the vertical from the anterior margin of the eye. The upper and lower profiles nearly equally convex Opercular spot distinct.

From the Seychelles to the coast of New Guinea.

a–d. Half-grown: not good state. From the Haslar Collection.
e. Half-grown: very bad state. Madras. Presented by T. C. Jerdon, Esq.
f. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.

26. Caranx malam.

Selar malam, *Bleeker, Java,* iii. p. 362, and *Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 55.

D. 8–9 $\big|\,\frac{1}{23-24}$. A. 2 $\big|\,\frac{1}{20}$. L. lat. 50–56.

The teeth of the jaws form a single series; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $3\frac{1}{4}$–$3\frac{1}{3}$ in the total length, the length of the head $4\frac{1}{2}$–$4\frac{3}{4}$. The jaws are equal in length, the maxillary reaching beyond the vertical from the anterior margin of the eye. Breast scaly; the lateral line is strongly bent anteriorly, and becomes straight below the origin of the second dorsal. Opercular spot and the first dorsal black. (*Bl.*)

Sea of Batavia.

27. Caranx brevis.

Selar brevis, *Bleeker, Java,* iii. p. 361, and *Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 54.

D. 8 | $\frac{1}{23}$. A. 2 | $\frac{1}{18}$. L. lat. 40.

The teeth of the jaws form a single series; teeth on the vomer, the palatine bones and the tongue. The height of the body is three times in the total length, the length of the head $4\frac{1}{3}$. The snout is pointed, with the lower jaw prominent; the upper maxillary reaches beyond the vertical from the anterior margin of the eye. The upper and lower profiles are equally convex. Belly compressed; breast scaly. The lateral line is strongly bent anteriorly, and becomes straight below the origin of the second dorsal. Opercular spot black. (*Bl.*)

Sea of Batavia.

28. Caranx plagiotænia.

Carangoides plagiotænia, *Bleek. Act. Soc. Sc. Indo-Nederl.* ii. *Amboina,* p. 59.

D. 8 | $\frac{1}{22-23}$. A. 2 | $\frac{1}{19}$. L. lat. 40.

The teeth in both the jaws form villiform bands; minute teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $2\frac{2}{3}$ to three times in the total length, the length of the head $4\frac{1}{4}$ to $4\frac{1}{3}$; the snout is obtuse, shorter than the eye, the diameter of which is $2\frac{3}{5}$–$2\frac{2}{3}$ in the length of the head. The lower jaw is longer than the upper, and the maxillary does not reach to the vertical from the centre of the eye. Breast scaly; the lateral line is slightly bent, and becomes straight below the posterior half of the dorsal fin; the plates are rather small. Body with six indistinct cross-bands, descending forwards; another band through the eye. (*Bl.*)

Sea of Amboyna.

29. Caranx senegallus.

Cuv. & Val. ix. p. 78.

D. 7 | $\frac{1}{21}$. A. 2 | $\frac{1}{17-18}$. L. lat. 40–43.

The teeth in the jaws form villiform bands. The height of the body is $3\frac{1}{2}$ in the total length, the length of the head five times. Dorsal and anal fins elevated and pointed anteriorly. Breast naked; the lateral line is strongly bent anteriorly, and becomes straight below the origin of the soft dorsal; the plates are well developed. Opercular spot none. (*Cuv.*)

Mouth of the Senegal.

30 Caranx ire.

Cuv. & Val. ix. p. 57.

D. $8 \left| \frac{1}{23} \right.$. A. $2 \left| \frac{1}{20} \right.$. L. lat. 30–34.

The teeth in both the jaws are in a narrow villiform band. The height of the body is $3\frac{1}{3}$–$3\frac{1}{2}$ in the total length, the length of the head 4–$4\frac{1}{2}$, the length of the pectoral $4\frac{1}{2}$–5. The lateral line is slightly bent, and becomes straight below the anterior quarter of the dorsal; its plates are moderate. Opercular spot none; the second dorsal with a large black blotch on the top.

Coast of Pondicherry; Sea of Madras.

a. Adult. Madras. Presented by T. C. Jerdon, Esq.
b. Half-grown.

31. Caranx præustus.

Caranx præustus, *Bennett, Life of Raffles*, p. 689.
Carangoides præustus, *Bleeker, Makr.* p. 363, and *Verh. Bat. Gen.* xxiv. *Makr.* p. 60.

D. $8 \left| \frac{1}{21-22} \right.$. A. $2 \left| \frac{1}{18} \right.$. L. lat. 20–30.

The teeth in both the jaws form villiform bands; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $3\frac{1}{4}$ $3\frac{1}{2}$ in the total length, the length of the head 4–$4\frac{1}{3}$. The snout is rather pointed, with the jaws equal; the upper maxillary reaches beyond the vertical from the anterior margin of the eye. Breast scaly; the lateral line is moderately bent, and becomes straight below the second third of the soft dorsal; the plates are of moderate size. The soft dorsal anteriorly deep black, with the top yellow. (*Bl.*)

Seas of Batavia and Sumatra.

32. Caranx stellatus.

Eydoux & Souleyet, Voy. Bonite, Zool. i. p. 167. pl. 3. f. 2.

D. $8 \left| \frac{1}{22} \right.$. A. $2 \left| \frac{1}{19} \right.$. L. lat. 30.

The teeth in both the jaws form a single series. The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{2}$. The snout is rather obtuse, with the lower jaw a little longer than the upper. The upper profile is much more convex than the lower. Breast scaly; the lateral line is slightly bent, and becomes straight in the vertical from the eleventh dorsal ray. Dorsal and anal fins pointed. Body with scattered brown specks; pectorals blackish. (*Eyd. & Soul.*)

Sandwich Islands.

33. Caranx malabaricus.

Scomber malabaricus, *Bl. Schn.* p. 31.
Russell, p. 37. pl. 150.
Caranx cæruleo-pinnatus, *Rüpp. Atl. Fische*, p. 100, and *N. W. Fische*, p. 47. taf. 13. f. 2 (not *Cuv.*).

Caranx malabaricus, *Cuv. & Val.* ix. p. 121; *Richards. Ichth. Chin.* p. 275; *Cant. Catal.* p. 128.
Carangoides talamparah, *Bleeker, Verh. Bat. Gen.* xxiv. *Makr.* p. 64.

D. $8 \left| \frac{1}{21-22} \right.$. A. $2 \left| \frac{1}{17} \right.$. L. lat. 25–30.

The teeth in both the jaws are minute, villiform, arranged in bands; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $2\frac{1}{4}$ to $2\frac{3}{4}$ in the total length, the length of the head $3\frac{2}{3}$ to 4 times. The snout is obtuse, equal to, or rather longer than the diameter of the eye, with the lower jaw longer than the upper; the maxillary reaches to, or very slightly beyond, the vertical from the anterior margin of the eye. The præorbital above the angle of the mouth is lower than the orbit. Breast naked; the lateral line is moderately bent, and becomes straight behind the middle of the second dorsal; the plates are little developed. Fins pointed, without filiform ray. Opercular spot brown; the dorsal and anal fins with a brown margin, ventrals and anal whitish.

From the Red Sea, through all the East Indian Seas, to the coast of Australia.

Cantor describes the teeth as velvety, but those on each side of the symphysis of the jaws as a little longer than the rest, which we do not observe in the following specimens.

a. Adult. Madras. Presented by T. C. Jerdon, Esq.
b. Adult: skin. Sea of Pinang. From Dr. Cantor's Collection.
c. Adult. Moluccas. Purchased of Mr. Frank.
d. Adult. China.
e. Adult. China. Presented by J. R. Reeves, Esq.
f. Adult. Australia. From Mr. Macgillivray's Collection.
g. Adult.

34. **Caranx talamparoides.**

Carangoides talamparoides (!)*, *Bleeker, Sumatra,* i. p. 579.

D. $7-8 \left| \frac{1}{22} \right.$. A. $2 \left| \frac{1}{18} \right.$. L. lat. 25–30.

The teeth in both the jaws are in villiform bands; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $2\frac{3}{4}$–$2\frac{5}{8}$ in the total length, the length of the head $3\frac{3}{4}$–$3\frac{7}{8}$; the upper profile is slightly concave before the eyes. The snout is scarcely longer than the diameter of the eye, and has the upper jaw rather shorter than the lower; the maxillary reaches to the vertical from the anterior margin of the eye. The præorbital, above the angle of the mouth, is a little lower than the orbit. Breast naked; the lateral line is moderately bent, and becomes straight behind the middle of the second dorsal; the plates are small. Opercular spot brown.

Seas of Sibogha (Sumatra) and Ceylon.

This species appears scarcely to differ from *Caranx malabaricus.*

a. Adult: skin. Ceylon. From Dr. Kelaart's Collection.

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* May Dr. Bleeker be reminded of that "non Botanicus, sed Botanicoides, *Linné, Critic. Botan.* p. 35.

35. **Caranx equula.**

Caranx equula, *Temm. & Schleg. Faun. Japon. Poiss.* p. 111. pl. 60. f. 1.
Selar equula, *Bleeker, Verhand. Batav. Genootsch.* xxv. p. 14.
Carangoides equula, *Bleeker, l. c.* xxvi. *Japan*, p. 102.

$\text{D. } 8 \left| \frac{1}{25} \right.$. $\text{A. } 2 \left| \frac{1}{23} \right.$. L. lat. 25–30.

The teeth in the jaws form villiform bands; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $2\frac{3}{4}$ in the total length, the length of the head $3\frac{3}{4}$; the snout is rather shorter than the eye; the upper profile much more convex than the lower. Breast scaly; the lateral line is moderately bent, and becomes straight below the posterior third of the dorsal fin; the plates are rather small. Coloration uniform.

Sea of Japan.

36. **Caranx hemigymnostethus.**

Carangoides hemigymnostethus, *Bleek. Makr.* p. 364, and *Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 61.

$\text{D. } 8 \left| \frac{1}{31} \right.$. $\text{A. } 2 \left| \frac{1}{25} \right.$. L. lat. 25.

The teeth in both the jaws form villiform bands; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is three times in the total length, the length of the head $4\frac{3}{4}$–5 times. The snout is obtuse, with the jaws equal, and the maxillary reaches to the vertical from the anterior margin of the eye. The inferior part of the breast scaleless; the lateral line is scarcely bent. Caudal edged with black. (*Bl.*)

Sea of Batavia.

37. **Caranx bajad.**

Scomber bajad, *Forsk.* p. 55.
Caranx bajad, *Rüpp. Atl. Fische*, p. 98. taf. 25. f. 5.
—— fulvoguttatus, *Cuv. & Val.* ix. p. 75 (not *Rüpp.*).
? Caranx gymnostethus, *Cuv. & Val.* ix. p. 73.
Carangoides fulvoguttatus, *Bleek. Nat. Tydschr. Nederl. Ind.* ii. p. 178, and *Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 89.

$\text{D. } 8 \left| \frac{1}{28\text{–}29} \right.$. $\text{A. } 2 \left| \frac{1}{24\text{–}25} \right.$. L. lat. 15.

The teeth in both the jaws form villiform bands; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $3\frac{1}{4}$ in the total length, the length of the head four times. The jaws are equal in front, and the maxillary does not reach to the vertical from the anterior margin of the eye. Breast naked; the lateral line is slightly bent, and becomes straight below the middle of the soft dorsal; the plates are little developed. Opercular spot none.

Red Sea; Sea of Batavia.

Rüppell, who examined specimens from the Red Sea, has found numerous pyloric appendages, but no air-bladder.

38. Caranx fulvoguttatus.

Scomber fulvoguttatus, *Forsk.* p. 56.
Caranx fulvoguttatus, *Rüpp. Atl. Fische*, p. 100. taf. 25. f. 7.
—— auroguttatus, (*Ehrenb.*) *Cuv. & Val.* ix. p. 71.

D. 8 | $\frac{1}{23-25}$. A. 2 | $\frac{1}{22-23}$. L. lat. 15.

The teeth in the jaws form villiform bands. The height of the body is $3\frac{1}{3}$ in the total length, the length of the head four times; eye shorter than the snout. The maxillary reaches to the vertical from the anterior margin of the eye. A naked space on the breast; the lateral line is slightly bent, and becomes straight below the middle of the soft dorsal. The plates are strongly keeled. Opercular spot none.

Red Sea.

39. Caranx ferdau.

Scomber ferdau, *Forsk.* p. 55.
Caranx ferdau, *Rüpp. Atl. Fische*, p. 99. taf. 25. f. 6; *Cuv. & Val.* ix. p. 56.

D. 7 | 23. A. 2 | 20.

The teeth of the jaws are arranged in bands. The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{2}$; the eye is rather large, the diameter being equal in length to the snout. The lower jaw extends beyond the upper, and the maxillary beyond the vertical from the anterior margin of the eye. The lateral line is parallel to the dorsal profile, and becomes straight behind the middle of the second dorsal; the plates are little developed, and in small number. Five blackish transverse spots on the side of the body.

Red Sea.

40. Caranx broekmeyeri.

Selar broekmeyeri, *Bleeker, Java*, iii. p. 398.

D. 8 | $\frac{1}{24}$. A. 2 | $\frac{1}{20}$. L. lat. 35.

The teeth in the jaws form single series; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{2}$. The upper jaw is shorter than the lower, and the maxillary reaches beyond the vertical from the anterior margin of the eye. The dorsal profile is more convex than the lower; the belly compressed behind the ventrals. Breast scaly; the lateral line is moderately bent, and becomes straight below the second quarter of the soft dorsal. Opercular spot brown; ten indistinct transverse spots along the side of the back; dorsal and anal fins white at the top. (*Bl.*)

Brackish waters of Eastern Java.

41. Caranx chilensis.

Gay, Hist. Chil. Zool. ii. p. 235, *Ictiol. Atl.* lam. 6. f. 2.

D. 8 | $\frac{1}{26}$. A. 2 | 22. L. lat. 30?

The teeth of the jaws form a single series; teeth on the vomer, the palatine bones (and on the tongue). The height of the body is $3\frac{2}{3}$ in the total length, the length of the head four times. [The maxillary does not reach to the vertical from the anterior margin of the eye?] Breast scaly; the lateral line is moderately bent anteriorly, and becomes straight behind the anterior third of the first dorsal; the plates are moderately developed, and do not occupy the whole of the straight portion of the lateral line. Opercular spot black; body uniform. (*Gay.*)

Juan Fernandez.

42. Caranx georgianus.

Caranx platessa, *Cuv. & Val.* ix. p. 84.
—— georgianus, *Cuv. & Val.* ix. p. 85; *Jenyns, Zool. Beagle, Fishes*, p. 71; *Richards. Ann. & Mag. Nat. Hist.* 1843, xi. p. 27, and *Ichth. Voy. Ereb. & Terr.* p. 135. pl. 58. f. 1-3 (not good: the lower profile too convex).

$$\text{D. } 8 \left| \frac{1}{26\text{–}29}. \quad \text{A. } 2 \right| \frac{1}{22\text{–}24}. \quad \text{L. lat. } 20\text{–}25.$$

The teeth in both the jaws are very small, arranged in a double or single series in both the jaws; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $3\frac{1}{3}$–$3\frac{3}{4}$ in the total length, the length of the head 4–$4\frac{1}{2}$. Upper jaw a little the longer. The maxillary reaches not quite to beneath the anterior margin of the orbit. Breast scaly; the lateral line follows the curvature of the back, and becomes straight below the middle of the soft dorsal; the plates are little developed. Opercular spot black; top of the spinous dorsal blackish.

Coasts of New Holland and New Zealand; Norfolk and Raoul Islands.

The teeth stand originally in two series in both the jaws, but the interior may be lost in the upper or in the lower jaw, or in both.

a. Adult. Raoul Island. Voyage of H.M.S. Herald.
b. Half-grown: not good state. N.W. Australia. Presented by Sir J. Richardson.
c–e. Adult: skins. Swan River.
f–h. Adult and half-grown: not good state. From the Haslar Collection.
i–l. Half-grown. From the Haslar Collection.

This species is closely allied to *C. dentex*, from which it differs by the presence of teeth on the palate.

bb. Teeth on the palate none.

43. Caranx leptolepis.

Caranx leptolepis et mertensii, *Cuv. & Val.* ix. pp. 63, 64.
—— leptolepis, *Cant. Catal.* p. 127.
Leptaspis leptolepis, *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 71.
Selaroides leptolepis, *Bleek. l. c.* p. 87.

$$\text{D. } 8 \left| \frac{1}{24\text{–}26}. \quad \text{A. } 2 \right| \frac{1}{20\text{–}23}. \quad \text{L. lat. } 25\text{–}30.$$

Teeth of the tongue and lower jaw minute, absent in the upper, on the vomer and the palatine bones. The height of the body is $3\frac{1}{2}$–4 times in the total length, the length of the head $4\frac{1}{4}$–$4\frac{1}{2}$. The jaws are equal anteriorly, and the maxillary reaches to, or nearly to, the vertical from the anterior margin of the eye. Breast scaly; the lateral line is moderately bent, and becomes straight below the middle of the soft dorsal; the plates are little developed and scarcely armed. Opercular spot sometimes absent.

Indian Archipelago; Australia.

a, b. Young: skins. Malayan Peninsula. From Dr. Cantor's Collection.

c, d. Fine specimens. Australia. From Mr. Macgillivray's Collection.

44. **Caranx dentex.**

Scomber dentex, *Bl. Schn.* p. 30.
Caranx luna, *Geoffr. Descr. Eg.* pl. 23. f. 3; *Cuv. & Val.* ix. p. 80; *Guichen. Explor. Algér. Poiss.* p. 62.
Citula banksii, *Risso, Eur. Mérid.* iii. p. 422. pl. 6. f. 13.
Caranx dentex, *Cuv. & Val.* ix. p. 87.
—— analis, *Cuv. & Val.* ix. p. 88; *Webb & Berthel. Hist. Nat. Iles Canar. Poiss.* p. 57. pl. 12.

D. $8 \mid \frac{1}{24-27}$. A. $2 \mid \frac{1}{20-22}$. L. lat. 24.

The teeth in the jaws form a single series; vomerine and palatine teeth none; a single series of teeth along the middle of the tongue. The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{3}{4}$; the pectoral reaches to the middle of the anal. Breast scaly; the lateral line runs parallel to the upper profile of the back, and becomes straight in the vertical from the posterior third of the anal. The plates are rather small. The upper jaw is longer than the lower; the snout is elongate, the upper maxillary reaching scarcely to the vertical from the anterior margin of the eye, the diameter of which is one-fifth or one-sixth the length of the head (in adult specimens). Opercular spot distinct.

Mediterranean; Madeira; Canary Islands; St. Helena; Coast of Brazil.

a. Very fine specimen: nineteen inches long. Lanzarote. Presented by the Rev. R. T. Lowe.
b–d. Fine specimens. Madeira. Presented by the Rev. R. T. Lowe.
e. Young. Madeira. Presented by the Rev. R. T. Lowe.
f. Thirty-three inches long: stuffed.
g–i. Young. New Orleans.
k. Half-grown.

45. **Caranx amblyrhynchus.**

Caranx amblyrhynchus, *Cuv. & Val.* ix. p. 100. pl. 248.
—— falcatus, *Holbr. Ichthyol. S. Carol.* p. 92. pl. 13. f. 2.

D. $7 \mid \frac{1}{27}$. A. $2 \mid \frac{1}{23-24}$. L. lat. 48–50.

The teeth are very small, and form a single series in both the jaws; minute deciduous teeth on the vomer, the palatines, and on the tongue; sometimes entirely absent. The height of the body is $2\frac{2}{3}$–3 times in the total length, the length of the head five times. Breast scaly; the curve of the lateral line is semicircular, and becomes abruptly straight below the fourth dorsal ray; the plates are well developed, and occupy the whole of the straight portion of the line. The jaws are equal anteriorly, and the upper maxillary reaches somewhat beyond the vertical from the anterior margin of the eye. The upper caudal lobe much longer than the lower. Opercular spot none; base of the pectoral deep black.

Coasts of Brazil and South Carolina.

a. South America. Purchased of Mr. Brandt.
b. Bahia. Purchased of M. Parzudaki.

46. **Caranx bicolor.**

D. $7 \left| \frac{1}{26} \right.$. A. $2 \left| \frac{1}{22} \right.$. L. lat. 45.

The teeth are minute, and form a single series in both the jaws; palate toothless. The height of the body is $2\frac{2}{3}$ in the total length, the length of the head $4\frac{2}{5}$. Breast scaly; the curve of the lateral line is semicircular, and becomes abruptly straight below the first dorsal ray; the plates are well developed, and occupy the whole of the straight portion of the line. The lower jaw is slightly longer than the upper, and the maxillary reaches to the vertical from the anterior margin of the eye. Caudal lobes equal in length. A black opercular spot; dorsal, anal, and ventral black; caudal, pectoral, and base of the pectoral yellowish; body with five blackish cross-bands (in immature specimens?).

Sierra Leone.

a, b. Sierra Leone. From the Collection of the Zoological Society.

Description.—The specimens are apparently immature, showing, however, sufficient characters by which the species may be readily distinguished from *C. amblyrhynchus*. The body is compressed, elliptical, with the upper and lower profiles equally curved; its greatest depth is between the origin of the soft dorsal and anal fins, where it is contained $2\frac{2}{3}$ in the total length. The head is of moderate size, as high as long, with the upper side strongly convex. The snout is rather short, a little longer than the diameter of the eye, with the cleft of the mouth oblique, and with the lower jaw slightly prominent; the maxillary extends to the vertical from the anterior margin of the eye. The teeth in the jaws are minute, forming a single series; the palate is smooth, but the tongue appears to be provided with some asperities. The nostrils stand nearer to the superior angle of the orbit than to the extremity of the snout. The eye is situated nearer to the upper profile of the head than to the lower. The præoperculum has the margin entire, and the lower limb much shorter than the posterior; both meet at a rather obtuse angle, which, however, is rounded.

The spinous dorsal commences behind the vertical from the base of the pectoral; its spines are stoutish: the third and fourth are the longest, one-fourth of the length of the head; there is a horizontal spine, belonging to one of the interneurals, in front of the fin. The origin of the soft dorsal falls in the middle between the extremity of the snout and the base of the caudal fin; it has no prominent point; its anterior portion is rounded, and one of the longest anterior rays is more than one-half the length of the head. The caudal is forked, with the lobes nearly equal, of the same length as the head. The anal spines are stout, the anterior being much shorter than the second; the soft anal begins in the vertical from the sixth dorsal ray, and is very similar to the opposite fin in form and height. The pectoral is slightly pointed, and extends to the vertical from the origin of the soft anal; its length is one-fifth of the total. The ventral is inserted exactly below the base of the pectoral, extending to the vent; its length is one-ninth of the total.

The scales are very small. The lateral line makes anteriorly a semicircular curve, the width of which is contained $2\frac{2}{3}$ times in the length of the straight portion; it becomes straight below the origin of the second dorsal, and is armed with high and narrow plates, nearly all of which terminate in a depressed spine.

The ground-colour is brownish; the body and tail are crossed by five blackish bands, with a sixth band-like blotch on the operculum; the dorsal, anal, and ventral fins are black; the caudal fin and the pectoral with its axil yellowish.

	inches.	lines.
Total length	3	8
Height of the body	1	5
Length of the head	0	10
——— of the fourth dorsal spine	0	$2\frac{1}{2}$
——— of the third dorsal ray	0	6
——— of the caudal	0	10
——— of the third anal ray	0	6
——— of the pectoral	0	9
——— of the ventral	0	5

47. Caranx helvolus.

Scomber helvolus, *Forster*; *Bl. Schn.* p. 35; *Forster, Descr. Anim. cur. Lichtenst.* p. 415.
Caranx helvolus, *Cuv. & Val.* ix. p. 104.
—— micropterus, *Rüpp. N. W. Fische*, p. 46. taf. 13. f. 1.

$$\mathrm{D.}\ 6 \left| \frac{1}{28}. \right.\quad \mathrm{A.}\ \frac{1}{20}.\quad \mathrm{L.\ lat.}\ 36.$$

The first dorsal fin small; anal spines none. Teeth in both the jaws in a single series, without canines; vomerine, palatine, and lingual teeth none. The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $3\frac{3}{4}$. Breast naked; the lateral line is slightly bent, and the straight portion begins somewhat before the vertical from the middle of the dorsal. The plates are well developed, and occupy the whole of the straight portion of the lateral line. The lower jaw is rather longer than the upper, and the maxillary reaches beyond the vertical from the anterior margin of the eye; eye large, its diameter being $4\frac{1}{2}$ in the length of the head. Opercular spot none; palate and tongue covered with a thick white membrane, posteriorly black.

Atlantic? Red Sea.

a. Thirteen inches long. From Forster's Collection.—Type of the species.

48. **Caranx uraspis.**

Uraspis carangoides, *Bleek. Amboina,* vi. p. 418.

D. 8 | $\frac{1}{28}$. A. 2 | $\frac{1}{21}$. L. lat. 32.

The teeth are arranged in two series in each of the jaws; none on the vomer, the palatines, or on the tongue. The height of the body is $2\frac{3}{4}$ in the total length, the length of the head four times. The snout is obtuse, and has the lower jaw rather longer than the upper; the maxillary reaches to below the centre of the eye. Breast naked; the lateral line is moderately bent, and becomes straight below the middle of the soft dorsal; the plates are small. The first anal spine rudimentary. Body with five broad dark cross-bands; palate black; the spinous dorsal black, the soft and the anal white at the top. (*Bl.*)

Sea of Amboyna.

49. **Caranx speciosus.**

Scomber speciosus, *Forsk.* p. 54; *L. Gm.* p. 1332; *Shaw, Zool.* iv. p. 603.
Caranx speciosus, *Lacép.* iii. p. 72. pl. 1. f. 1.
Russell, ii. p. 36. pl. 149.
Caranx speciosus, *Cuv. & Val.* ix. p. 130; *Cant. Catal.* p. 133; *Peters, Wiegm. Arch.* 1855, p. 245 (not *Rüpp.*).
—— petaurista, *Geoffr. Descr. Eg.* pl. 23. f. 1 (not *Rüpp.*).
Gnathanodon speciosus, *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 72.
Caranx poloosoo, *Richards. Voy. Ereb. & Terr. Ichth.* pl. 58. f. 4, 5.

D. 7 | $\frac{1}{18\text{–}20}$. A. 2 | $\frac{1}{15\text{–}16}$. L. lat. 15.

Teeth none, or nearly imperceptible. The height of the body is one-third of the total length, the length of the head one-fourth; breast scaly; the lateral line is bent, and becomes straight below the anterior third of the soft dorsal: the plates are small. The lower jaw is rather shorter than the upper; the upper maxillary reaches to the vertical from the anterior margin of the eye. Silvery, with six brown vertical bars, and with six narrower stripes between; the first bar through the eye. Adult specimens uniform.

From the Red Sea, through all the Indian Seas, to the coast of New Holland.

a. Half-grown. Madras. Presented by T. C. Jerdon, Esq.
b. Thirty-three inches long: stuffed. Madras. Presented by T. C. Jerdon, Esq.
c. Half-grown. Philippine Islands.

d. Half-grown. Borneo.
e. Half-grown. Sunda Sea.
f–h. Half-grown and young: skins. Sea of Pinang. From Dr. Cantor's Collection.
i. Australia. From Mr. Dring's Collection.

Caranx speciosus, Rüpp., appears to be a different species. He describes it (*Atl. Fische*, p. 96) as having the same forms as *C. petaurista*, Rüpp., which, as may be seen from the figure, decidedly is not *C. petaurista*, Geoffr., or *C. speciosus*, Lacép., Cuv.

50. Caranx rüppellii.

Caranx petaurista, *Rüpp. Atl. Fische*, p. 95. pl. 25. f. 2 (not *Geoffr.*).

D. $6 \left| \frac{1}{19} \right.$. A. $2 \left| \frac{1}{16} \right.$.

Teeth none. The height of the body is contained three times in the total length, the length of the head five times and two-thirds. The snout is obtuse, and the upper maxillary reaches to, or beyond, the vertical from the centre of the eye. The lateral line is bent anteriorly, and becomes straight below the middle of the soft dorsal. The plates are small; anal spines little developed. Coloration uniform; snout with some reddish dots. (*Rüpp.*)

Red Sea.

b. The teeth in the upper jaw form a villiform band, with an outer series of stronger ones; those of the lower in a single series.

51. Caranx fusus.

Geoffr. Descript. Egypte, pl. 24. f. 3; *Cuv. & Val.* ix. p. 52.

D. $8 \left| \frac{1}{24} \right.$. A. $2 \left| \frac{1}{20} \right.$. L. lat. 45.

The teeth of the jaws form a band, with an outer series of stronger ones. The height of the body is one-fourth of the total length. The lateral line is moderately bent anteriorly, and becomes straight below the origin of the soft dorsal. The lower jaw is rather longer than the upper. Opercular spot present.

Coast of Alexandria.

52. Caranx chrysos.

Scomber chrysos, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 424.
Caranx chrysos, *Dekay, New York Fauna, Fishes*, p. 121. pl. 27. f. 85; *Baird, Ninth Smithson. Report*, p. 336 (not *Cuv. & Val.*).
—— hippos, *Holbr. Ichth. S. Carol.* p. 88. pl. 12. f. 2.
—— pisquetus, *Cuv. & Val.* ix. p. 97; *Casteln. Anim. nouv. ou rares*, p. 22; *Guichen. Poiss. in Ramon de la Sagra, Hist. Cuba*, p. 111. pl. 3. f. 2.
Trachurus squamosus, *Gronov. Syst. ed. Gray*, p. 125.

D. $8 \left| \frac{1}{23} \right.$. A. $2 \left| \frac{1}{20} \right.$. L. lat. 45.

The teeth in the upper jaw are in a villiform band, the outer series of which contains larger ones; teeth of the lower jaw in a single series. The height of the body is $3\frac{1}{2}$–$3\frac{2}{3}$ in the total length; the length of the head $4\frac{1}{2}$, and nearly equal to that of the pectoral. The lateral line is bent downwards below the origin of the second dorsal; its plates are well developed along all the straight portion. Jaws equal in length anteriorly; the upper maxillary reaches beyond the vertical from the anterior margin of the eye. A black spot on the operculum.

Atlantic coasts of temperate America to the West Indies.

a. Adult. N. America. From Mr. Warwick's Collection.
b–d. Adult: not good state. N. America. From Mr. Warwick's Collection.
e. Half-grown. S. America. Presented by Sir R. Schomburgk.
f. Adult.
g. Adult: skin. From Gronow's Collection.

53. Caranx melampygus.

? *Russell,* ii. pl. 145.
Caranx melampygus, *Cuv. & Val.* ix. p. 116; *Bleek. Gilolo,* p. 58.

$$D.\ 8\left|\frac{1}{23}\right..\quad A.\ 2\left|\frac{1}{19}\right..\quad L.\ lat.\ 36.$$

The teeth of the upper jaw form a band, with an outer series of larger ones; those of the lower are in a single series; teeth on the vomer, the palatines, and on the tongue. The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{3}$–$4\frac{2}{3}$; the pectoral reaches to the eighth anal ray. The width of the interocular space is rather less than that of the orbit. Breast scaly; the lateral line is bent anteriorly, and becomes straight in the vertical from the fifth dorsal ray; the plates are well developed. The lower jaw is slightly longer than the upper, and the maxillary does not reach to the vertical from the centre of the eye. Opercular spot small; the dorsal and anal fins blackish anteriorly.

From Ile de France to Polynesia.

a. Fine specimen. Guadalcana. From the Museum of Economic Geology.
b. Young. Tonga Islands. From the Haslar Collection.
c. Young. Wanderer Bay. From the Museum of Economic Geology.

54. Caranx jarra

Yarradanree parah, *Russell,* ii. p. 35. pl. 147.
Caranx jarra, *Cuv. & Val.* ix. p. 109; *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 58.

$$D.\ 8\left|\frac{1}{22}\right..\quad A.\ 2\left|\frac{1}{18}\right..\quad L.\ lat.\ 36.$$

The teeth of the upper jaw form a band, with an outer series of larger ones; those of the lower are in a single series; teeth on the vomer, the palatines, and on the tongue. The height of the body is $3\frac{1}{3}$ in the total length, the length of the head $4\frac{3}{4}$; the pectorals are much longer than the head. Breast naked. The lateral line is bent and waving anteriorly, becoming straight in the vertical from the fifth dorsal ray. The lower jaw is longer than the upper, and the maxillary does not reach to the vertical from the centre of the eye.

Seas of Sumatra and Amboyna; coast of Coromandel.

a. Half-grown. Amboyna. Purchased of Mr. Frank.

55. **Caranx cynodon.**

Bleeker, Makr. p. 362, and *Verhand. Batav. Gen.* xxiv. *Makr.* p. 57.

D. $8\,\big|\,\frac{1}{21}$. A. $2\,\big|\,\frac{1}{17}$. L. lat. 34–38.

The teeth in the upper jaw are in a villiform band, the outer series of which contains larger ones; teeth of the lower jaw in a single series, with canines anteriorly. Teeth on the vomer, the palatines, and on the tongue. The height of the body equals the length of the head, and is one-fourth of the total. The lower jaw prominent, the maxillary reaching beyond the vertical from the middle of the eye. Breast scaly; the lateral line becomes straight behind the origin of the soft dorsal, and has the plates well developed. Opercular spot and axil black; caudal with the posterior margin black. (*Bl.*)

Sea of Batavia.

56. **Caranx lepturus.**

? Caranx lepturus, *Agass. in Spix, Pisc. Bras.* p. 106. tab. 56 *b*. f. 2.

D. $8\,\big|\,\frac{1}{22}$. A. $2\,\big|\,\frac{1}{18\text{–}19}$. L. lat. 35.

The teeth of the upper jaw form a villiform band, with an outer series of stronger ones; those of the lower are in a single series; teeth on the vomer, the palatines, and on the tongue. The height of the body is $2\frac{3}{4}$ in the total length, and the length of the head four times. Breast scaly; the lateral line is bent anteriorly, the width of the arch being contained $1\frac{1}{2}$ in the length of the straight portion; the latter begins in the vertical from the fifth dorsal ray. The plates are moderately developed and distinct along all the straight portion of the lateral line. The lower jaw projects very little beyond the upper, and the maxillary does not reach to the vertical from the centre of the eye. Opercular spot none.

? Atlantic.

a–i. Half-grown. From the Haslar Collection.
k. Young. Purchased of Mr. Brandt.
l. Twenty-seven inches long: stuffed.

57. **Caranx sansun.**

Scomber sansun, *Forsk.* p. 56.
Russell, ii. p. 33. pl. 144.
Caranx sansun, *Rüpp. Atl. Fische*, p. 101, and *N. W. Fische*, p. 48. taf. 13. f. 3.

D. $8\,\big|\,\frac{1}{19\text{–}20}$. A. $2\,\big|\,\frac{1}{16\text{–}17}$. L. lat. 30.

The teeth of the upper jaw form a villiform band, with an outer series of stronger ones; those of the lower are in a single series. The height of the body is 3–$3\frac{1}{2}$ in the total length. Breast sealy; the lateral line is bent anteriorly, the width of the arch being equal, or nearly equal, to the length of the straight portion; the latter begins in the vertical from the seventh dorsal ray. The plates are very well developed and distinct from the beginning of the straight portion. The lower jaw is longer than the upper, and the maxillary reaches beyond the vertical from the centre of the eye. Opercular spot none.

Red Sea; Mauritius; coast of Coromandel.

a. Half-grown. Mauritius. From the Collection of the Zoological Society.

b. Twenty inches long: stuffed. India. From the Collection of the East India Company.

58. **Caranx carangus.**

Scomber, sp., *Gronov. Zoophyl.* no. 307.
Scomber carangus, *Bloch,* taf. 340; *Bl. Schn.* p. 28; *Bennett, Whaling Voyage,* ii. p. 282 (Caranx antilliarum).
Ekalah para, *Russell,* ii. p. 35. pl. 146.
? Caranx latus, *Agass. Spix, Pisc. Bras.* p. 105. tab. 56 *b*. f. 1.
Caranx carangus, *Cuv. & Val.* ix. p. 91; *Cuv. Règne Anim. Ill. Poiss.* pl. 57. f. 2; *Guichen. Poiss. in Ramon de la Sagra, Hist. Cuba,* p. 111.
—— chrysos, *Cuv. & Val.* ix. p. 98 (not *Mitch.*).
—— ekala, *Cuv. & Val.* ix. p. 117; *Bleek. Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 59.
—— xanthopygus, *Cuv. & Val.* ix. p. 109; *Bleek. Sumbawa.*
—— lessonii, *Bleek. Faun. Midd. en Oost-Java* (not *Cuv. & Val.*).
—— richardi, *Holbr. Ichth. S. Carol.* p. 94. pl. 13, lower figure.
Trachurus cordyla, *Gronov. Syst. ed. Gray,* p. 124.

D. $8 \Big| \frac{1}{20\text{–}22}$. A. $2 \Big| \frac{1}{16\text{–}18}$. L. lat. 30–33.

The teeth of the upper jaw form a villiform band, with an outer series of stronger ones; those of the lower form a single series, intermixed with larger teeth. The height of the body is three times, the length of the head four times, and that of the pectoral $3\frac{2}{3}$ in the total length. Breast naked. The lateral line is bent, the width of the arch being $1\frac{1}{3}$ or $1\frac{2}{5}$ in the length of the straight portion; the latter begins abruptly in the vertical from the sixth dorsal ray. The plates are well developed and distinct along all the straight portion of the lateral line. The lower jaw is rather longer than the upper; the upper maxillary reaches behind the vertical from the centre of the eye. Opercular spot generally distinct.

From the west coast of Africa to the Atlantic coasts of tropical America; Indian Ocean and Archipelago.

A. *Atlantic specimens.*

a. Fine specimen. Niger Expedition. From Mr. Fraser's Collection.
b, c. Young. S. Domingo. Purchased of Mr. Cuming.
d. Young. West Indies.
e. Young: skin. From Gronow's Collection.

B. *Indian specimens.*

f. Half-grown. India.
g, h. Young. Madras. Presented by T. C. Jerdon, Esq.
i. Half-grown. Amboyna. Purchased of Mr. Frank as *C. ekala.*
k. Half-grown. Sumatra. Purchased of Mr. Frank.
l–n. Half-grown. Old Collection.
o. Half-grown: bad state. From the Haslar Collection.
p. Half-grown. From the Haslar Collection.
q–s. Young. From the Collection of the Zoological Society.

59. **Caranx hippos.**

Guara tereba, *Marcgr.* p. 172; *Seba*, iii. 27. 3.
Scomber hippos, *L. Syst. Nat.* i. p. 494 (not *Mitch.*); *Bl. Schn.* p. 28; *Forst. Descr. Anim. cur. Licht.* p. 199.
—— kleinii, *Bl.* taf. 347. f. 2; *Bl. Schn.* p. 30.
Russell, ii. pl. 148.
Caranx fallax, *Cuv. & Val.* ix. p. 95; *Casteln. Anim. nouv. ou rares, Poiss.* p. 22; *Guichen. Poiss. in Ramon de la Sagra, Hist. Cuba*, p. 111.
—— sem, *Cuv. & Val.* ix. p. 105.
—— forsteri, *Cuv. & Val.* ix. p. 107; *Cant. Catal.* p. 127; *Bleek. Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 57, and *Natuurk. Tydschr. Nederl. Ind.* 1852, iii. p. 164.
—— sexfasciatus, *Quoy & Gaim. Voy. Freyc.* p. 358. pl. 65. f. 4; *Cuv. & Val.* ix. p. 110 (young).
?Caranx peronii, *Cuv. & Val.* ix. p. 112.
Caranx lessonii, *Cuv. & Val.* ix. p. 113 (not *Bleek.*); *Less. Voy. Coq. Zool. Poiss.* p. 155. pl. 31. f. 1.
—— belengerii, *Cuv. & Val.* ix. p. 116.
—— defensor, *Dekay, New York Fauna, Fishes*, p. 120. pl. 24. f. 72; *Holbr. Ichth. S. Carol.* p. 85. pl. 12. f. 1 (eye too small).
—— flavo-cæruleus, *Schleg. Faun. Japon.* p. 110. pl. 59. f. 2.
—— paraspistes, *Richards. Ichth. Voy. Ereb. & Terr.* p. 136. pl. 58. f. 6, 7.

$$\text{D. } 7\text{–}8 \,\Big|\, \frac{1}{19\text{–}22}. \quad \text{A. } 2 \,\Big|\, \frac{1}{16\text{–}17}. \quad \text{L. lat. } 30\text{–}36.$$

The teeth of the upper jaw form a villiform band, with an outer series of stronger ones; those of the lower form a single series, intermixed with larger teeth. The height of the body is $3\frac{1}{5}$ in the total length, the length of the head four times, and the length of the pectoral $3\frac{3}{4}$. Breast scaly; the lateral line is strongly bent, the width of the arch being $1\frac{1}{2}$–$1\frac{2}{3}$ in the length of the straight portion; the latter begins abruptly in the vertical from the third dorsal ray. The plates are very well developed and distinct along all the straight portion of the lateral line. The lower jaw is rather longer than the upper; the maxillary reaches somewhat behind the vertical from the centre of the eye. Opercular spot none, or very indistinct; top of the second dorsal blackish.

Atlantic coasts of temperate and tropical America; all the East Indian Seas, into the Pacific, and the shores of Australia.

A. *Atlantic specimens.*

a. Half-grown. St. Vincent. Presented by the Lords of the Admiralty.
b–f. Half-grown and young: skins. Jamaica. From Dr. Parnell's Collection.
g. Adult. Puerto Cabello. Purchased of Mr. Brandt.
h. Fine specimen. S. America. Presented by Sir R. Schomburgk.
i. Adult: skin. W. Indies. Purchased of Mr. Scrivener.
k. Young.

B. *Australian and Indian specimens.*

l. Half-grown. Madagascar. Presented by Dr. J. E. Gray.
?*m.* Half-grown: skin: not good state. Port Natal. From Sir A. Smith's Collection.
n. Half-grown. China.
o. Adult. China (*Caranx flavo-cæruleus*).
p. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
q. Fine specimen. Amoy (China).
r. Adult. Tanna. From the Museum of Economic Geology.
s. Half-grown. Ceylon. Presented by Sir A. Smith.
t, u. Half-grown: skins. Sea of Pinang. From Dr. Cantor's Collection.
v. Eighteen inches long: stuffed. Port Essington. Presented by the Earl of Derby.—Type of *Caranx paraspistes.*
w, x. Young. From the Haslar Collection.

2. One or several of the rays of the dorsal and anal fins elongate.

60. **Caranx atropus.**

Brama atropus, *Bl. Schn.* p. 98. t. 23.
Russell, ii. p. 38. pl. 152.
Caranx nigripes, *Cuv. & Val.* ix. p. 122; *Richards. Ichth. Chin.* p. 275; *Cantor, Catal.* p. 129.
Olistus atropus, *Cuv. & Val.* ix. p. 141.
Carangoides atropus, *Bleek. Makr.* p. 366, and *Verh. Bat. Gen.* xxiv. *Makr.* p. 66.
Caranx atropus, *Cantor, Catal.* p. 130.

$$\mathrm{D.}\ 8 \,\Big|\, \tfrac{1}{22}. \quad \mathrm{A.}\ 2 \,\Big|\, \tfrac{1}{18}. \quad \mathrm{L.\ lat.}\ 35. \quad \mathrm{Vert.}\ 10/14.$$

The first dorsal ray not produced; males generally with several of the middle dorsal rays elongate and filiform. The teeth in both the jaws are minute, villiform, arranged in bands. The height of the body is $2\frac{1}{3}$ in the total length; the length of the head $4\frac{1}{2}$, equal to that of the pectoral and ventral fins. The space between the pectoral, ventral, and eye naked. The lateral line is strongly bent, and becomes straight below the anterior quarter of the soft dorsal. There are thirty-five plates of moderate size along the straight portion. The cleft of the mouth very oblique, with the lower jaw prominent; the upper maxillary reaches beyond the vertical from the anterior margin of the orbit. No spot on the operculum; ventrals deep black, with the base and the outer margin white.

East Indian Seas.

a. Adult. China.
b. Adult. China.
c. Adult: skeleton. China. Presented by J. R. Reeves, Esq.
d. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
e, f. Half-grown. Madras. Presented by T. C. Jerdon, Esq.
g, h. Adult and half-grown: skins. Sea of Pinang. From Dr. Cantor's Collection.
i–m. Adult. Sand Heads. Presented by G. R. Waterhouse, Esq.
n, o. Half-grown.
p. Young. India. Presented by G. R. Waterhouse, Esq.
q, r. Half-grown. East Indies. From Dr. Cantor's Collection.

Skeleton.—The skull is distinguished by a very high crest, beginning from the anterior extremity of the frontal bones. The maxillary becomes gradually wider posteriorly; the intermaxillary has the posterior processes rather short, and a slight prominence on its posterior edge; the muciferous channels of the mandibula and of the præoperculum are rudimentary. The posterior præopercular limb is nearly three times as long as the inferior, and also the operculum, the humerus, and the ulna are very elongate in the vertical direction; the coracoid is feeble, rib-like. Each of the pubic bones is composed of three narrow lamellæ. There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·8. The anterior vertebræ are compressed in their longitudinal diameter. The neural and hæmal spines are erect and strong, especially the hæmal of the first caudal vertebra, which, together with the first interhæmal, forms a very solid base for the two anal spines; this interhæmal is widened inferiorly into a broad triangular plate. There are three spurious interneurals immediately behind the occipital crest. The interhæmals and interneurals are dilated and transparent; two are always united to one neural or hæmal. The ribs are very slender and provided with exceedingly feeble epipleurals.

61. **Caranx ophthalmotænia.**

Carangoides ophthalmotænia, *Bleek. Amboina & Ceram*, p. 270.

$$\text{D. } 8 \left| \tfrac{1}{27}. \right. \quad \text{A. } 2 \left| \tfrac{1}{23}. \right. \quad \text{L. lat. } 35.$$

The first dorsal ray is produced; the anal half as high as the body. The teeth in both the jaws are arranged in villiform bands; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $2\frac{1}{2}$–$2\frac{3}{5}$ in the total length, the length of the head four times. The snout is scarcely longer than the eye, and has the lower jaw longest; the maxillary reaches to the vertical from the anterior margin of the eye. Breast naked; the lateral line is moderately

bent, and becomes straight below the second third of the soft dorsal; the plates are small. A brown band from the eye to the back. (*Bl.*)
Sea of Amboyna.

62. Caranx oblongus.

Caranx oblongus, *Cuv. & Val.* ix. p. 128; *Cant. Catal.* p. 132.
Carangoides oblongus, *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 62.

D. $8 \left| \frac{1}{21} \right.$. A. $2 \left| \frac{1}{18\text{–}19} \right.$. L. lat. 36–40.

The first ray of the dorsal elongate and filiform; the anal much lower than the body. The teeth in both the jaws form villiform bands; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $2\frac{3}{4}$–$3\frac{1}{3}$ in the total length, the length of the head $4\frac{1}{2}$–$5\frac{1}{2}$. The snout is equal in length to the diameter of the eye, or very little longer. The upper maxillary reaches to below the centre of the eye. Breast naked; the lateral line is moderately bent, and becomes straight below the second fifth of the soft dorsal; the plates are well developed. Ventrals yellowish.
East Indian Archipelago; Polynesia.

a. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.

63. Caranx chrysophryoides.

? Caranx chrysophrys, *Cuv. & Val.* ix. p. 77. pl. 247.
Carangoides chrysophryoides, *Bleeker, Makr.* p. 366, and *Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 63.

D. $8 \left| \frac{1}{19} \right.$. A. $2 \left| \frac{1}{16} \right.$. L. lat. 20–25.

The teeth in both the jaws form villiform bands; teeth on the vomer, the palatine bones, and on the tongue. The first ray of the dorsal and anal fins is sometimes produced and filiform. The height of the body is $2\frac{2}{3}$ to 3 times in the total length, the length of the head 4–$4\frac{1}{4}$ The snout is longer than the eye, and the maxillary reaches to, or somewhat beyond, the vertical from the anterior margin of the eye. Breast naked; the lateral line is parallel to the upper profile, and becomes straight below the posterior third of the soft dorsal. Opercular spot black. (*Bl.*)
Sea of Batavia. (Seychelles?)

64. Caranx dinema.

Carangoides dinema, *Bleeker, Makr.* p. 367, and *Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 63.

D. $8 \left| \frac{1}{18} \right.$. A. $2 \left| \frac{1}{17} \right.$. L. lat. 25.

The teeth in both the jaws form villiform bands; teeth on the vomer, the palatine bones, and on the tongue. The first ray of the dorsal and anal fins is very elongate and filiform. The height of the body is three times in the total length, the length of the head $4\frac{1}{2}$.

The upper jaw is somewhat longer than the lower, and the maxillary reaches to below the middle of the eye. Breast naked; the lateral line is moderately bent, and becomes straight behind the vertical from the middle of the soft dorsal. Opercular spot none. (*Bl.*)

Sea of Batavia.

65. Caranx armatus.

Sciæna armata, *Forsk.* p. 53; *Gm. L.* p. 1306.
Russell, pl. 151. p. 38 (young).
Citula plumbea, *Quoy & Gaim. Voy. Freyc. Zool. Poiss.* p. 361.
—— ciliaria, *Rüpp. Atl. Fische*, p. 102. taf. 25. f. 8.
—— armata, *Rüpp. Atl. Fische*, p. 103, and *N. W Fische*, p. 50.
Caranx citula, *Cuv. & Val.* ix. p. 126.
—— armatus, *Cuv. & Val.* ix. p. 127; *Cantor, Catal.* p. 131.
—— ciliaris, *Cuv. & Val.* ix. p. 129 (young); *Faun. Japon. Poiss.* p. 112; *Richards. Ichth. Chin.* p. 276.
—— cirrhosus, (*Ehrenb.*) *Cuv. & Val.* pl. 250.
Olistus malabaricus, *Cuv. & Val.* ix. p. 137. pl. 251; *Cuv. Règne Anim. Ill. Poiss.* pl. 58. f. 1.
—— rüppellii, *Cuv. & Val.* ix. p. 144.
Carangoides citula, *Bleeker, Verh. Bat. Gen.* xxiv. *Makr.* p. 65.

D. $7\text{–}8 \mid \frac{1}{20\text{–}21}$. A. $2 \mid \frac{1}{16\text{–}17}$. L. lat. 20.

The teeth form villiform bands in both the jaws; teeth on the vomer, palatines, and on the tongue. The first ray of the dorsal and anal fins, and in males generally some of the middle rays, exceedingly elongate and filiform. The height of the body is twice or thrice in the total length, the length of the head $3\frac{1}{2}$ to 5 times. The snout is obtuse, equal in length to the diameter of the eye, and has the lower jaw longest; the maxillary reaches beyond the vertical from the anterior margin of the eye. Breast naked; the lateral line is moderately bent, and becomes straight below the posterior half of the second dorsal. The plates are little developed. Opercular spot brown, indistinct in immature specimens, which have the body banded; the first ray of the dorsal and anal fins generally black; ventrals blackish.

From the Red Sea, through all the Indian Seas, to the coast of New Guinea.

a. Large specimen, with the dorsal rays elongate.
b, *c*. Half-grown: skins. Sea of Pinang. From Dr. Cantor's Collection.
d. Half-grown. Purchased of Mr. Frank.
e. Adult. Moluccas. Purchased of Mr. Frank as *Citula oblonga*.
f. Adult. Moluccas. Purchased of Mr. Frank.
g. Half-grown. Moluccas. Purchased of Mr. Frank.
h. Adult. Sumatra. Purchased of Mr. Frank.
i. Adult. Sumatra. Purchased of Mr. Frank.
k. Half-grown. Sumatra. Purchased of Mr. Frank.
l. Half-grown. Sumatra. Purchased of Mr. Frank.
m. Half-grown. China.

B. The spinous dorsal very little developed, or disappearing with age.

66. Caranx ciliaris.

Zeus ciliaris, *Bloch*, vi. p. 29. taf. 191; *L. Gm.* p. 1223; *Bl. Schn.* p. 94; *Shaw, Zool.* iv. p. 283; *Lacép.* iv. pp. 570, 572.
Scomber filamentosus, *Mungo Park, Linn. Trans.* iii. p. 36; *Bl. Schn.* p. 34.
Blepharis indicus, *Cuv. & Val.* ix. p. 154; *Faun. Japon. Poiss.* p. 113. pl. 60. f. 2; *Cuv. Règne Anim. Ill. Poiss.* pl. 58. f. 3; *Richards. Ichth. Chin.* p. 271.
—— fasciatus, *Rüpp. Atl. Fische*, p. 129. taf. 33. f. 2 (not *Richards.*).
Carangoides blepharis, *Bleeker, Verh. Bat. Gen.* xxiv. *Makr.* p. 67.

D. 6 $\big|\,\frac{1}{19}$. A. 2 $\big|\,\frac{1}{16}$. L. lat. 15.

The teeth in both the jaws form villiform bands; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $1\frac{3}{4}$–$1\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{2}$. The first dorsal little developed, with the spines short and rudimentary; the anterior rays of the second dorsal and anal exceedingly elongate and filiform. The lower jaw is longer than the upper, and the maxillary reaches beyond the vertical from the anterior margin of the eye. The width of the opercle is one-half its height. The lateral line is bent anteriorly, and becomes straight below the middle of the soft dorsal; the plates are very little developed. Opercular spot and the membrane between the first five dorsal rays black. Body with six subvertical blackish bands, becoming less distinct with age.

Pyloric appendages very numerous.

From the Red Sea, through all the Indian Seas.

a. Half-grown. Amboyna. Purchased of Mr. Frank.
b. Adult. India. Presented by W. Masters, Esq.
c. Adult. From the Collection of the Zoological Society.
d. Adult.
e. Adult: bad state.
f. Adult. From the Haslar Collection.

67. Caranx sutor.

? Blepharis sutor, *Cuv. & Val.* ix. p. 161; *Guichen. Poiss. in Ramon de la Sagra, Hist. Cuba*, p. 114.
Blepharis major, *Cuv. & Val.* ix. p. 163.
Zeus crinitus, *Akerly, Amer. Journ. Sc.* xi. p. 144, with plate.
Blepharis crinitus, *Dekay, New York Fauna, Fishes*, p. 123. pl. 25. f. 76.

D. 6 $\big|\,\frac{1}{19}$. A. 2 $\big|\,\frac{1}{16}$. L. lat. 12.

The teeth in both the jaws form villiform bands; teeth on the vomer, the palatines, and on the tongue. The height of the body is $1\frac{2}{3}$ in the total length, the length of the head $3\frac{1}{2}$. The first dorsal is little developed, with the spines short and rudimentary; the anterior rays of the second dorsal and anal exceedingly long and filiform. The lower jaw is longer than the upper, and the maxillary reaches beyond the vertical from the anterior margin of the eye.

The width of the opercle is one-third of its height. The lateral line is bent anteriorly, and becomes straight in the vertical from the middle of the soft dorsal; the plates are very little developed. Opercular spot indistinct; the membrane between the anterior dorsal rays blackish.

Caribbean Sea, spreading to the coasts of New York.

a. Fine specimen. Cuba. From the Collection of the Zoological Society.

b, *c*. Young. South America. Presented by Sir W. Hooker.—The first dorsal fin is very distinct, with the middle spines longest; the anterior ray of the dorsal and anal fins and the outer one of the ventral are exceedingly long and filiform, ornamented with brown rings; an indistinct brown band through the eye.

68. **Caranx alexandrinus.**

Geoffr. Descr. Eg. Poiss. pl. 22. f. 2.
Scyris alexandrina, *Cuv. & Val.* ix. p. 152.
Gallichthys egyptiacus, (*Ehrenb.*) *Cuv. & Val.* ix. p. 176; *Cuv. Règne Anim. Ill. Poiss.* pl. 59. f. 1.

$$\text{D. } 5 \,\Big|\, \tfrac{1}{21}. \quad \text{A. } \tfrac{1}{19}. \quad \text{L. lat. } 3\text{–}4.$$

The first dorsal not developed, distinctly visible in immature specimens; the ventrals and the anterior rays of the dorsal and anal fins very elongate, filiform. Dentition probably as in *C. gallus*. The height of the body is $1\frac{1}{2}$ in the total length, the length of the head $3\frac{1}{2}$; the height of the præorbital is much more than the length of the diameter of the eye. The origin of the soft dorsal is the highest point of the back, from which the upper profile rapidly descends, being convex on the nape of the neck. Lower jaw prominent. The lateral line is strongly curved anteriorly, and becomes straight below the middle of the dorsal; the plates are exceedingly small. Scales none. Uniform silvery (immature specimens with more or less distinct vertical bands); the filiform rays black.

North coast of Egypt; coast of West Africa.

a. Half-grown: not good state. Ashantee. Purchased of Mr. Frank.
b. Young. Congo Expedition.

69. **Caranx gallus.**

Meer-hæn, *Nieuhof, Zee- en Lant-Reize*, i. p. 270, cum fig.
Valent. iii. p. 465. f. 376; *Renard*, ii. 26. 128; *Ruysch, Theatr. Anim.* i. 9. 7; *Seba*, iii. 26. 34; *Willughby, Append.* tab. 7. f. 1.
Zeus, sp. no. 2, *Artedi, Genera*, p. 50 (not synon.).
—— gallus, *L. Syst.* i. p. 454; *Bloch*, taf. 192. f. 1; *Bl. Schn.* p. 94.
—— sp., *Gronov. Mus.* i. no. 108.
Russell, i. p. 45. pl. 57, p. 46. pl. 58.
Gallus virescens, *Lacép.* iv. pp. 583, 584.
Gallichthys major, *Cuv. & Val.* ix. p. 168. pl. 254; *Richards. Ichth. Chin.* p. 271; *Cantor, Catal.* p. 136.
—— chevola, *Cuv. & Val.* ix. p. 175.

Scyris indica, *Rüpp. Atl. Fische*, p. 128. taf. 33. f. 1; *Cuv. & Val.* ix. p. 145. pl. 252; *Rüpp. N. W. Fische*, p. 51; *Richards. Ichth. Chin.* p. 276; *Cantor, Catal.* p. 134; *Règne Anim. Ill. Poiss.* pl. 58. f. 2.
Carangoides gallichthys, *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 68.

B. 6. D. $\frac{1}{19}$. A. $\frac{1}{16}$. L. lat. 8. Vert. 10/14.

The first dorsal not developed, and in old specimens entirely absent; the ventrals and the anterior rays of the dorsal and anal fins very elongate, filiform. The teeth in both the jaws form villiform bands; teeth on the vomer, the palatine bones, and on the tongue. The height of the body is $1\frac{2}{3}$ to $2\frac{1}{3}$ in the total length; the height of the præorbital is much more than the length of the diameter of the eye. The origin of the soft dorsal is the highest point of the back, from which the upper profile rapidly descends, being strongly convex on the nape of the neck. Lower jaw prominent. The lateral line is strongly curved anteriorly, and becomes straight below the middle of the dorsal; the plates are very little developed. Scales none. Uniform silvery; immature specimens with vertical bands.

Pyloric appendages numerous.

From the Red Sea, through all the Indian Seas.

a. Twenty-three inches long: skin. Malayan Peninsula. From Dr. Cantor's Collection.
b, c. Half-grown: skins. Malayan Peninsula. From Dr. Cantor's Collection.
d. Adult. Java.
e. Adult: stuffed: bad state. China. Presented by J. R. Reeves, Esq.
f. Half-grown. China.
g. Adult. From the Haslar Collection.
h. Adult: skeleton. From the Haslar Collection.

Skeleton.—The skull is distinguished by its singularly oblique form, the bones having the appearance as if they were dislocated in the direction from the occiput towards the mandibula. In other respects, there is no essential difference from the typical forms of *Caranx*. The skull is compressed and elevated; the occipital crest is exceedingly high, and extends from the anterior extremity of the frontal bones to the occipital joint, above which it is highest and rounded. The lateral crests are rather low. The maxillary becomes gradually wider posteriorly, and has a narrow supplementary bone along its upper edge. The intermaxillary has a flat prominence behind, and its posterior processes are nearly as long as the bone itself. The mandibula is rather short and elevated, with a rudimentary muciferous channel; there is a small free space between the dentary and the articular bone. The axes of the præopercular limbs form a very obtuse angle; the interior ridge is flat and depressed, and the portion of the bone which is situated between the ridge and the margin is rather narrow and very thin. The width of the operculum is one-half its height; it has a slight notch posteriorly, and another superiorly. The interoperculum is much longer than the suboperculum. The turbinal bones are elongate tubes. The bones of the infraorbital ring are very thin, membranaceous; the præorbital is oblong, its longest diameter being in the direction from the orbit to the jaw-bones. The suprascapula is fixed to the skull by two styliform processes; the scapula is narrow; the lower part of the humerus and the ulna are very long, with an open slit between them. Each pubic bone is composed of three narrow lamellæ.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 2·1. The four anterior vertebræ are much compressed in their longitudinal diameter, and Cuvier has overlooked the first, stating only nine abdominal vertebræ. The neurals and hæmals are strong and more or less erect, especially those of the caudal portion. The interneurals and interhæmals are well developed. The first interhæmal is exceedingly long, extending upwards to the base of the hæmal, to which it is joined; inferiorly, it has a flat triangular prominence, pointing forwards.

It is quite evident, from an examination of the skeleton, that this species is a true *Caranx*. The bones which form the base of the spinous dorsal are very close together, and consequently the spinous rays cannot be so well developed as in the other species. They are, however, present, and the specimen described exhibits distinctly six small dorsal spines.

70. Caranx goreensis.

Hynnis goreensis, *Cuv. & Val.* ix. p. 195. pl. 257.

B. 8. D. $\frac{1}{22}$. A. $\frac{1}{19}$. L. lat. 12. Cæc. pylor. 25–30.
Vert. 10/16 (*Cuv.*).

The teeth in both the jaws form villiform bands; teeth on the vomer and the palatine bones. The first dorsal has entirely disappeared; none of the rays elongate. The height of the body is $2\frac{1}{2}$, the length of the head four times in the total. The snout is elevated, rather obtuse, with the lower jaw longest. The lateral line is bent, and becomes straight below the middle of the soft dorsal; plates small and few in number. Silvery: axil black. (*Cuv.*)

Coast of Gorea.

4. ARGYREIOSUS.

Argyreiosus, *Lacép.* iv. p. 566.
Argyreiosus et Vomer, *Cuv. & Val.* ix. pp. 177, 189.

Body much compressed and elevated; cleft of the mouth moderate. Præorbital very high. The first dorsal continuous, sometimes rudimentary, the second dorsal and anal more developed; anal spines none, or separated from the soft fin by an interspace. Scales none, or very rudimentary; lateral line with an anterior curve and with a posterior straight portion, without any plate-like scales. Dentition feeble; teeth on the vomer and the palatine bones. Seven branchiostegals; air-bladder simple, bifurcate posteriorly. Pyloric appendages in great number.

Coasts of tropical and temperate America.

1. Argyreiosus vomer.

Awah-kattoe-jahwe, *Laët, Ind. Occid.* p. 574.
Abacatuia, *Marcgr.* p. 161. fig. p. 145.
Petiver, Gazophyl. i. pl. 59. f. 3.
Lune, *Dutertre, Hist. Antilles,* p. 215, p. 209. fig.
Zeus vomer, *L. Mus. Ad. Fred.* pl. 31. f. 9, and *Syst.* i. p. 454; *Bl.* taf. 193; *Bl. Schn.* p. 95; *Gronov. Syst. ed. Gray,* p. 129.
Argyreiosus vomer, *Lacép.* iv. pp. 566, 567; *Agass. Spix, Pisc. Bras.* p. 109. tab. 58; *Cuv. & Val.* ix. p. 177. pl. 255; *Cuv. Règne Anim. Ill. Poiss.* pl. 59. f. 2; *Dekay, New York Fauna, Fishes,* p. 124. pl. 75. f. 238; *Casteln. Anim. nouv. Poiss.* p. 23.
Zeus niger, *Bl. Schn.* p. 98.
Selene argentea, *Lacép.* iv. pp. 560, 562. pl. 9. f. 2.
Zeus capillaris, *Mitch. Trans. Lit. & Phil. Soc. New York,* i. p. 383. pl. 2. f. 2.
—— rostratus, *Mitch. l. c.* p. 384. pl. 2. f. 1.
Argyreiosus capillaris, *Dekay, New York Fauna, Fishes,* p. 125. pl. 27. f. 82.
—— spixii, *Casteln. l. c.*
Skeleton: *Owen, Osteolog. Catal.* i. p. 64.

$$\text{D. } 8 \left| \tfrac{1}{22}. \right. \quad \text{A. } 0\text{–}2 \left| \tfrac{1}{18}. \right. \quad \text{V. } 1/5. \quad \text{Vert. } 10/14^{*}.$$

The second and third dorsal spines, the anterior dorsal and anal rays, and the ventrals more or less elongate and filiform. The convexity of the back very much stronger than that of the belly. The distance between the roots of the pectoral and ventral fins is contained twice and a half in the height of the body. Uniform silvery; the prolonged fin-rays blackish.

Atlantic coasts of temperate and tropical America.

a. Fine specimen. New Orleans. Purchased of Mr. Cuming.
b. Adult. Texas. Purchased of Mr. Brandt.
c, d. Half-grown. Texas. Purchased of Mr. Brandt.
e. Half-grown. Demerara. Presented by Sir W. Holmes.
f. Adult: stuffed. Bahia.
g–i. Adult: skins. West Indies. From Dr. Parnell's Collection.
k. Half-grown: skin.
l. Half-grown. Purchased of Mr. Frank.
m. Half-grown. Purchased of Mr. Frank.
n, o. Half-grown. Old Collection.
p. Half-grown. From the Haslar Collection.
q. Half-grown. From the Haslar Collection.
r. Young.
s. Adult: skeleton. Texas. Purchased of Mr. Brandt.

Young? an spec. nov.? None of the spines or rays of the fins are elongate; the convexity of the belly is very much stronger than that of the back. A blackish spot on the straight portion of the lateral line.

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* Vert. 19/13 *Cuv.*

a, *b*. $1\frac{1}{2}$ inch long.
c. One inch long.

The *skeleton* is so extremely similar to that of *Caranx gallus*, that we should not hesitate to unite both fishes in one and the same genus, if the principal character of *Caranx*, the shielded lateral line, were not lost by so doing. The pubic bones are very small in this species; the second interhæmal is united with the first, and the third and the fourth have flat processes anteriorly, by which they are joined to the preceding spines.

2. Argyreiosus setipinnis.

Silver-fish, *Funnel, Dampier's Voy.* p. 8. f. 8.
Rhomboïda, *Brown, Jamaica*, p. 455.
Poisson lune, *Desmarchais, Voy.* ii. p. 23; *Barbot, Collect. of Voy.* pl. F. f. 128.
Zeus setapinnis, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 384. pl. 1. f. 9.
Vomer brownii, *Cuv. Règne Anim.*; *Agass. Spix, Pisc. Bras.* p. 110. tab. 57; *Cuv. & Val.* ix. p. 189. pl. 256; *Cuv. Règne Anim. Ill. Poiss.* pl. 59. f. 3; *Dekay, New York Fauna, Fishes*, p. 127. pl. 25. f. 78; *Guichen. in Ramon de la Sagra, Hist. Cuba, Poiss.* p. 116.
Skeleton: *Agass. Poiss. Foss.* v. p. 17. pl. A.

D. 8 $\Big|\frac{1}{21-25}$. A. $\frac{1}{17-20}$. V. 1/5. Vert. 10/14.

The spinous dorsal and the ventrals short, little developed; the soft dorsal and the anal not elongate. The height of the body is $1\frac{5}{6}$–$2\frac{1}{4}$ in the total length. The highest point of the upper profile is above the eye. Uniform silvery.

Pyloric appendages very numerous.

Atlantic; coast of Peru.

A. The height of the body is more than one-half the total length; D. 8 $\Big|\frac{1}{22}$. A. $\frac{1}{18-19}$. Perhaps a species.

a. Fine specimen. Fernando Po. From Mr. Fraser's Collection.
b. Fine specimen. S. Domingo. Purchased of Mr. Cuming.
c, *d*. Half-grown. S. Domingo. Purchased of Mr. Cuming.
e, *f*. Half-grown: skins. Jamaica. From Dr. Parnell's Collection.
g–*i*. Young: skins. Jamaica.
k. Adult: skin. West Indies.
l. Adult: stuffed. Bahia.
m. Half-grown. From the Haslar Collection.
n. Young: very bad state. From the Haslar Collection.
o. Young. From the Collection of the Zoological Society.

B. The height of the body is less than one-half of the total length; D. 8 $\Big|\frac{1}{25}$. A. $\frac{1}{20}$. Perhaps a species.

a. Adult. St. Vincent. Presented by the Lords of the Admiralty.

b. Adult: skin. West Indies.
c. Fine specimen.
d. Adult: skeleton.

C. The height of the body is less than one-half of the total length; D. 8 | $\frac{1}{21-22}$. A. $\frac{1}{18-19}$. Perhaps a species.

a–c. Adult: bad state. Pacific? From the Haslar Collection.
d. Adult: skeleton. Pacific? From the Haslar Collection.

5. MICROPTERYX.

Seriola, sp., *Cuv. Règne Anim.*
Micropteryx, *Agass. in Spix, Pisc. Bras.* p. 104.
Chloroscombrus, *Girard in Proc. Acad. Nat. Sc. Philad.* 1858, p. 168.

Body much compressed, with the abdomen prominent and trenchant, covered with small scales; lateral line not armed or shielded; præopercular margin entire. Cleft of the mouth rather small; præorbital of moderate width. The first dorsal continuous, with seven feeble spines; the second dorsal and anal more developed, without detached finlets; two anal spines, rather remote from the remainder of the fin. Dentition feeble; teeth on the vomer and the palatine bones. Seven branchiostegals; air-bladder simple, bifurcate posteriorly. Pyloric appendages in moderate number.

Atlantic; Indian Ocean.

1. Micropteryx chrysurus.

? *Renard,* i. tab. 6. f. 43; *Valent.* no. 43.
Scomber chrysurus, *L. Syst. Nat.* i. p. 494; *Bl. Schn.* p. 33.
—— chloris, *Bloch,* taf. 339; *Bl. Schn.* p. 27.
Micropteryx cosmopolita, *Agass. in Spix, Pisc. Bras.* p. 104. tab. 59.
Seriola cosmopolita, *Cuv. & Val.* ix. p. 219. pl. 259; *Dekay, New York Fauna, Fishes,* p. 129; *Holbr. Ichth. S. Carol.* p. 77. pl. 11. f. 1; *Guichen. Poiss. in Ramon de la Sagra, Hist. Cuba,* p. 117.
Scomber latus, *Gronov. Syst. ed. Gray,* p. 127.
Chloroscombrus cosmopolita, *Girard, Proc. Acad. Nat. Sc. Philad.* 1858, p. 168. Seriola chloris Holbr. Ichth. S. C. 2d ed.
—— caribbæus, *Girard, l. c.*

D. 7 | $\frac{1}{26-27}$. A. 2 | $\frac{1}{25-26}$. Cæc. pylor. 10–15. Vert. 10/14.

Scales small, but very distinct. The height of the body is 3–3$\frac{1}{3}$ in the total length, the length of the head 5$\frac{1}{3}$. The snout is obtuse, and equal in length to, or rather shorter than the diameter of the eye; the maxillary reaches to the vertical from the anterior margin of the eye. Abdomen much compressed, trenchant; the ventrals small. Coloration uniform; a blackish, squarish blotch on the back of the tail; ventrals white.

West coast of Africa; Atlantic coasts of temperate and tropical America, coast of Pondicherry.

a. Fine specimen. Niger Expedition. From Mr. Fraser's Collection.
b. Half-grown. Ashantee. Purchased of Mr. Frank.

c. Half-grown. Lake Champlain. Purchased of Mr. Frank.
d. Adult. North America. Purchased of Mr. Warwick.
e. Half-grown. New Orleans. Purchased of Mr. Cuming.
f. Adult. Cuba. Presented by the Zoological Society.
g, h. Half-grown. S. Domingo. Purchased of Mr. Cuming.
i–m. Half-grown: skins. Jamaica. From Dr. Parnell's Collection.
n, o. Half-grown: skins. West Indies.
p. Adult: not good state. Bahia. Purchased of M. Parzudaki
q, r. Half-grown. Brazils. Presented by Lord Stuart.
s. Adult: skin. From Gronow's Collection.
t. Half-grown. Presented by the Zoological Society.
u, v. Half-grown. From the Haslar Collection.
w. Half-grown. Purchased of Mr. Frank.
x, y. Adult: bad state. Old Collection.
z. Adult.
a. Half-grown: skeleton. Niger Expedition. From Mr. Fraser's Collection.

Skeleton.—The skull is rather compressed, and its upper surface is provided with five crests, the middle of which is strong, elevated, with the upper angle rounded, extending to the anterior extremity of the frontal bones. The jaw-bones are rather feeble and transparent. The præoperculum has the interior ridge scarcely prominent, and the muciferous channel appears to be very rudimentary; its inferior limb is shorter than the posterior, and the angle is rounded. The operculum is somewhat narrow, with a slight posterior notch; the sub- and interoperculum are obliquely directed upwards, and the latter is crescentic. The cavity formed by the humerus and the radius is oblong, quadrangular, the edges of the two bones running in a parallel direction; there is an ovate foramen near the symphysis of the humeral bones. The pubic bones are little developed and styliform.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being one-half of that of the latter. The neural and hæmal spines are strong, and the three anterior hæmals have an interior channel, and are sometimes united by bony cross-bars, like the processes of the ribs of birds. Each of the five posterior abdominal vertebræ has a pair of inferior apophyses at its anterior extremity, and another at its posterior; the apophyses of one side converge and are anchylosed together. The ribs are slender, styliform. The interneurals and interhæmals are dilated and transparent. The first interhæmal is exceedingly strong, firmly joined to the hæmal of the first caudal vertebra, somewhat concave anteriorly, and terminating in a dilated portion with an anterior and a posterior process; this bone forms the base for the two anal spines. The interhæmals of the first five anal rays also rest upon the first hæmal; the second hæmal supports only two interhæmals, the third three, the fourth again two, the fifth again three, &c. The base of the interhæmals, to which the anal rays are joined, is swollen, and emits a small oblique process for each of the anal rays.

6. SERIOLA*.

Seriola, pt., *Cuv. Règne Anim.*; *Cuv. & Val.* ix. p. 200.

Body oblong, slightly compressed, with the abdomen rounded, covered with small or rudimentary scales; cleft of the mouth moderate or rather wide. The first dorsal continuous, with the spines rather feeble; the second and the anal much more developed, without detached finlets. Generally a pair of spines before the anal, remote from the remainder of the fin. Lateral line not armed. Præoperculum not denticulated. The teeth in the jaws, on the vomer and the palatine bones form villiform bands. Branchiostegals seven; air-bladder simple. Pyloric appendages in great number.

Inhabitants of nearly all the temperate and tropical seas.

1. Seriola dumerilii.

Caranx dumerilii, *Risso, Ichth. Nice*, p. 175.
Seriola dumerilii, *Risso, Eur. Mérid.* iii. p. 424; *Cuv. & Val.* ix. p. 201. pl. 258; *Cuv. Règne Anim. Ill. Poiss.* pl. 56. f. 1; *Guichen. Explor. Algér. Poiss.* p. 62; *Webb & Berthel. Iles Canar. Poiss.* p. 57.
Seriola purpurascens, S. auro-vittata, et S. quinque-radiata, *Richards. Ichth. Chin.* p. 271 (not *Schleg.*).
—— purpurascens, *Schleg. Faun. Japon. Poiss.* p. 113. pl. 61; *Bleek. Verhand. Batav. Genootsch.* xxvi. *Japan*, p. 103.

D. $7 \left| \frac{1}{30\text{–}32} \right.$. A. $2 \left| \frac{1}{20} \right.$. Cæc. pylor. 50–60. Vert. 10/14.

Scales very small. The height of the body is $3\frac{3}{4}$–$3\frac{4}{5}$ in the total length, the length of the head four times. The snout is subconical, of moderate extent, and $1\frac{1}{2}$ the length of the diameter of the eye; the maxillary reaches nearly to the vertical from the centre of the eye. Abdomen broad, not compressed; the ventrals are of moderate length, one-half the distance between their base and that of the anal.

Mediterranean; Seas of Japan and China.

α. *European variety.* Coloration uniform; back bluish, belly silvery.

a. Fine specimen. Mediterranean.

β. *Japanese variety.* Coloration uniform; back purplish, belly silvery.

b. Fine specimen. China. Presented by J. R. Reeves, Esq.
c. Adult: stuffed. China. Presented by J. R. Reeves, Esq.

Schlegel states that the spinous dorsal commences in a vertical drawn from the base of the pectoral in *Seriola dumerilii*, whilst in *S. purpurascens* its origin is situated in a vertical from behind the base of the pectoral. I have found the position of this fin exactly the same in Mediterranean specimens as in Chinese, namely behind the vertical from the base of the pectoral.

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* 1. Seriola boscii, *Cuv. & Val.* ix. p. 209.—Coast of Carolina.
2. —— succincta, *Cuv. & Val.* ix. p. 218.—Atlantic.

2. Seriola lalandii.

The Yellow-tail (St. Helena).
Seriola lalandii, *Cuv. & Val.* ix. p. 208.
—— aureo-vittata, *Schleg. Faun. Japon. Poiss.* p. 115. pl. 62. f. 1 (not good).

$$\text{D. } 7 \left| \frac{1}{32\text{–}34} \right. . \quad \text{A. } 0\text{–}2 \left| \frac{1}{20\text{–}21} \right. .$$

Scales very small. The height of the body is $4\frac{1}{4}$–$4\frac{3}{4}$ in the total length, the length of the head $4\frac{1}{4}$–$4\frac{2}{3}$. The snout is elongate, conical, twice the length of the diameter of the eye. Abdomen broad, not compressed; the ventrals are of moderate length, their length being $2\frac{1}{2}$ in the distance between their base and that of the anal. The maxillary reaches somewhat beyond the vertical from the anterior margin of the eye. Coloration uniform.

From the coast of Brazil across the Atlantic to the Cape of Good Hope; Japanese Sea.

a. Forty-one inches long: stuffed. Cape Seas. From Sir A. Smith's Collection.
b. Adult: stuffed. Cape Seas. From Sir A. Smith's Collection.
c. Half-grown: stuffed. St. Helena (*Yellow-tail*). Presented by General Hardwicke.
d. Half-grown: stuffed.
e. Thirty-seven inches long: stuffed.
f. Forty-four inches long: stuffed.

Seriola dubia, Lowe, Proc. Zool. Soc. 1839, vii. p. 81, and Trans. Zool. Soc. iii. p. 5, is certainly distinct from *S. dumerilii*, but it may prove to be identical with *S. lalandii*. In order to decide this question, it will be necessary to compare the following notes, which the Rev. R. T. Lowe has communicated to me, with specimens of *S. lalandii* preserved in spirits:—

"The length of the single specimen, which had been taken at Madeira, was $29\frac{1}{2}$ inches. The thickness of the body is one-half of its height; the length of the head is contained four times and a half in the total; the height of the head at the nape is twelve-thirteenths of its length. The gape of the mouth reaches to the anterior margin of the eye, and the lower jaw is rather shorter than the upper. There is a rough tongue-shaped patch down the middle of the tongue, whilst rough spots may be observed on the rest of its surface. Operculum smooth, præoperculum striate. The length of the pectoral fin is contained eight times and three-sevenths in the total, that of the first dorsal eleven times and a fourth. The ventral fins are inserted exactly beneath the pectoral. The second dorsal is four times as high anteriorly as the first, the length of the first soft ray being more than half the height of the body. The anal fin commences before the middle of the second dorsal; the length of the caudal is contained five times and four-elevenths in the total.

$$\text{D. } 7 \left| \frac{1}{30} \right. . \quad \text{A. } 2 \left| \frac{1}{19} \right. .$$

There is a sufficiently distinct keel on the tail. Dusky steel-coloured, dark brownish on the back; no trace of a brown band from the eye to the operculum; the first dorsal fin mottled blue and black; the second dorsal, anal and caudal fins almost black; ventrals mottled blue, white and black."

3. Seriola quinqueradiata.

Schleg. Faun. Japon. Poiss. p. 115. pl. 62. f. 2.

D. $5 \left| \frac{1}{32} \right.$. A. $2 \left| \frac{1}{19} \right.$.

Scales very small. The height of the body is $4\frac{1}{4}$ in the total length. The snout is elongate. conical. Abdomen broad, rounded; the ventrals are of moderate length, their length being $2\frac{1}{2}$ in the distance between their base and the origin of the anal. Coloration uniform. (*Schleg.*)

Sea of Japan.

4. Seriola bonariensis.

? Seriola rivoliana, *Cuv. & Val.* ix. p. 207.
Seriola bonariensis, *Cuv. & Val.* ix. p. 211.

D. $7 \left| \frac{1}{29} \right.$. A. $2 \left| \frac{1}{21} \right.$.

Scales small. The height of the body is $3\frac{1}{3}$ in the total length, the length of the head four times. The snout is of moderate extent, $1\frac{1}{2}$ the diameter of the eye, and subconical; the maxillary does not reach to the vertical from the centre of the eye. Back, neck and abdomen slightly compressed; the ventrals are of moderate length, and reach to the vent; the soft dorsal is anteriorly half as high as the body. Coloration uniform; an oblique black band from the nape of the neck through the eye to the præorbital.

Coast of Brazil. (Mediterranean?)

a. Fine specimen. From the Collection of the Zoological Society.
b. Young.

5. Seriola falcata.

Cuv. & Val. ix. p. 210.

D. $7 \left| \frac{1}{31} \right.$. A. $2 \left| \frac{1}{19} \right.$.

Scales small. The height of the body is rather more than the length of the head, and one-fourth of the total. The snout is of moderate extent, conical, and $1\frac{1}{2}$ as long as the diameter of the eye. Abdomen broad, not compressed; the soft dorsal and anal pointed anteriorly and elevated; ventrals of moderate length. The maxillary reaches somewhat beyond the vertical from the anterior margin of the eye. Coloration uniform.

Atlantic coasts of tropical America.

a. Adult: skin. Jamaica. From Dr. Parnell's Collection.

6. Seriola fasciata.

Scomber fasciatus, *Bl.* taf. 341; *Bl. Schn.* p. 29.
Seriola fasciata, *Cuv. & Val.* ix. p. 211.

D. $7 \left| \frac{1}{30-31} \right.$. A. $2 \left| \frac{1}{20-21} \right.$.

Dorsal and anal fins not elevated. Body with sixteen narrow and somewhat irregular brown cross-bands, arranged in pairs; those between the soft dorsal and anal extend on to these fins, forming five spots on the former and three on the latter; a blackish band between the eyes; ventrals black.

Coast of Carolina.

7. Seriola zonata.

Scomber zonatus, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 427. pl. 4. f. 3.

Seriola zonata, *Cuv. & Val.* ix. p. 213; *Dekay, New York Fauna, Fishes*, p. 128. pl. 9. f. 26; *Holbr. Ichth. S. Carol.* p. 73. pl. 10. f. 1.

—— leiarchus, *Cuv. & Val.* ix. p. 213.

D. 7 | $\frac{1}{35\text{–}36}$. A. 0–2 | $\frac{1}{19\text{–}20}$.

Scales very small. The height of the body is $3\frac{1}{2}$–4 times in the total length, the length of the head $3\frac{3}{4}$; the snout is rather elongate, conical, $2\frac{1}{2}$ the diameter of the eye; the maxillary reaches to below the centre of the orbit. Abdomen broad, rounded; the ventrals are of moderate length, occupying rather more than one-half of the distance between their base and the origin of the anal. An oblique black band from the spinous dorsal to the eye. Body generally with six distinct black cross-bands, which extend on to the dorsal and anal fins, and form three black spots on the former and two on the latter.

Atlantic coasts of the United States.

a. Adult. North America. Purchased of Mr. Warwick.
b. Adult. North America. Purchased of Mr. Warwick.
c, *d*. Half-grown. North America. Purchased of Mr. Warwick.—All have been in chloride of zinc.

Seriola carolinensis (Holbr. Ichthyol. S. Carol. p. 70. pl. 10. f. 2), without cross-bands, and with twenty-two soft rays of the anal fin, appears to be merely a variety of *S. zonata*.

8. Seriola tapeinometopon.

Bleeker, Solor, p. 80.

B. 7. D. 7 | $\frac{1}{30}$. A. 2 | $\frac{1}{20}$.

Scales very small. The height of the body is $3\frac{1}{2}$ in the total length, the length of the head $3\frac{2}{3}$; the snout is pointed, and the maxillary reaches to below the pupil. An oblique blackish band from the spinous dorsal to the eye; body with five or six brownish cross-bands; dorsal and anal fins with a yellow margin. (*Bl.*)

Sea of Lawajong (Solor).

9. Seriola nigro-fasciata.

Nomeus nigro-fasciatus, *Rüpp. Atl. Fische*, p. 82. taf. 24. f. 2.

Seriola binotata, *Cuv. & Val.* ix. p. 215; *Cantor, Catal.* p. 137.

Seriola rüppellii, *Cuv. & Val.* ix. p. 216; *Bleeker, Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 73.
—— nigro-fasciata, *Rüpp. N. W. Fische,* p. 51.

B. 7. D. $5\text{–}6 \,\Big|\, \frac{1}{31\text{–}33}$. A. $\frac{1}{15\text{–}17}$. Cæc. pylor. 7.

Scales exceedingly small, rudimentary. The height of the body is $3\frac{2}{3}$ in the total length, the length of the head four times. The snout is obtuse, and equal in length to, or rather shorter than, the diameter of the eye. Abdomen broad, not compressed; the ventrals nearly as long as the head. The maxillary reaches to the vertical from the centre of the eye. Back crossed by six broad brown bands; ventrals, top of the dorsal and anal black.

Red Sea; East Indian Ocean and Archipelago; Louisiade Archipelago.

a. Adult: stuffed. Red Sea. From Dr. Rüppell's Collection.
b, c. Half-grown and young: skins. Sea of Pinang. From Dr. Cantor's Collection.
d. Young. Sea of Pinang. From Dr. Cantor's Collection.
e. Half-grown. Amboyna. Purchased of Mr. Frank.
f. Half-grown: not good state. Amboyna. Purchased of Mr. Frank.
g. Adult: stuffed. Louisiade Archipelago (30 fathoms). Voyage of the 'Rattlesnake.'

10. Seriola intermedia.

Schleg. Faun. Japon. Poiss. p. 116.

D. $7 \,\Big|\, \frac{1}{32}$. A. $1 \,\Big|\, \frac{1}{15}$.

Scales exceedingly small. The length of the ventrals is one-half the distance between their base and the origin of the anal. Back with four or five brownish bands descending obliquely forwards. (*Schleg.*)

Sea of Japan.

11. Seriola dussumieri.

Cuv. & Val. ix. p. 217.

D. $5 \,\Big|\, \frac{1}{27}$. A. $2 \,\Big|\, \frac{1}{18}$.

Body with seven vertical bands, the fourth, fifth and sixth extending on the soft dorsal, and the two latter on the anal; each lobe of the caudal with a blackish spot. Ventrals long. Perhaps founded on young specimens. (*Cuv.*)

Gulf of Bengal.

12. Seriola gigas.

D. $8 \,\Big|\, \frac{1}{24}$. A. $2 \,\Big|\, \frac{1}{16}$.

Scales small. The height of the body is $4\frac{4}{5}$ in the total length, and equal to the length of the head; the snout is of moderate extent, twice the diameter of the eye, and subconical. The maxillary reaches to the vertical from the anterior margin of the orbit. The ventrals are longer than the pectorals, but do not extend to the vent. The soft dorsal and anal are anteriorly elevated, their height being more than one-half of that of the body. Coloration uniform; sides sometimes dotted with brown.

Coasts of Australia.

a, *b*. Four feet long: stuffed. Houtman's Abrolhos.
c. Half-grown: stuffed. From Mr. Gould's Collection.

Description.—The body is rather elongate, its greatest depth being $4\frac{4}{5}$ in the total length; the length of the head equals the depth of the body. The snout is moderately long, twice, or in large specimens $2\frac{1}{2}$ the diameter of the eye. The maxillary is very broad posteriorly, its width being increased by a supplementary bone situated on its upper margin. The teeth form broad villiform bands; the band on the vomer is irregularly quadrangular (◇); that on the palatine bones is very broad, elliptical. The præoperculum has the angle rounded, and the lower limb half as long as the posterior; both meet at a rather obtuse angle. The dorsal spines are stoutish; the fifth is the longest, its length being $4\frac{2}{3}$–$5\frac{1}{3}$ in that of the head. The soft dorsal and the anal are somewhat elevated anteriorly, and the posterior ray of both fins is rather longer than the preceding ones (in large specimens). The anal spines are feeble. The caudal is deeply forked. The ventral is longer than the pectoral, pointed, and inserted below the posterior part of the root of the pectoral.

The scales are small; the lateral line is irregularly waving, and has posteriorly a slight keel.

	inches.	lines.
Total length	48	0
Height of the body	10	0
Length of the head	10	0
Diameter of the eye	1	6

7. SERIOLELLA.

Seriolella, *Guichen. in Gay, Fauna Chilena, Peces,* p. 238.

Body oblong, compressed; cleft of the mouth moderate. The first dorsal continuous, with the spines rather feeble; the second and the anal much more developed, without separate finlets; two spines before the anal, remote from the remainder of the fin. Body covered with small scales; the lateral line not armed. The teeth in the jaws of moderate size, *forming a single series*; teeth on the vomer, none on the palatine bones. *Præoperculum denticulated.* Branchiostegals six.

Coasts of Chile.

1. Seriolella porosa.

Guichen. l. c. p. 239, *Atlas Ictiol.* lam. 7. f. 2.

B. 6. D. $8 \left| \frac{1}{38} \right.$. A. $2 \left| \frac{1}{24} \right.$.

Scales small. The height of the body is $4\frac{1}{2}$ in the total length, and nearly equal to the length of the head; the snout is rather obtuse, and the maxillary reaches to below the anterior margin of the orbit. Præoperculum with the angle rounded and produced backwards, slightly denticulated. Caudal forked. Coloration uniform. (*Guich.*)

Valparaiso.

2. Seriolella violacea.

Guichen. l. c. p. 241. lam. 7. f. 1.

D. $8 \mid \frac{1}{27}$. A. $2 \mid \frac{1}{19}$ (according to the figure).

Scales small. The height of the body is one-fourth of the total length; the snout is obtuse, and the maxillary reaches to below the anterior portion of the orbit. Præoperculum with the angle rounded, not produced backwards, denticulated. Caudal slightly emarginate. Coloration uniform. (*Guich.*)

Valparaiso.

3. Seriolella cærulea.

Guichen. l. c. p. 242.

D. 10 | ?

Scales minute. The height of the body is one-third of the total length; caudal emarginate. Coloration uniform. (*Guich.*)

Island of Juan Fernandez.

8. SERIOLICHTHYS.

Seriolichthys, *Bleeker, Natuurk. Tydschr. Nederl. Ind.* 1854, vi. p. 195.

Body oblong, compressed, with the abdomen rounded, covered with small cycloid scales. Cleft of the mouth moderate. The first dorsal continuous; the second and the anal much more developed, *with a detached finlet posteriorly*; a pair of spines before the anal, rather remote from the remainder of the fin. Lateral line not armed; præoperculum slightly crenulated. The teeth in the jaws, on the vomer and the palatine bones form villiform bands. Branchiostegals seven.

East Indian Archipelago; Polynesia.

1. Seriolichthys bipinnulatus.

The Yellow-tail, (*Bennett*).
Seriola bipinnulata, *Quoy & Gaim. Voy. Uran. Zool.* i. p. 363. pl. 61. f. 3; *Cuv. Règne Anim. Ill. Poiss.* p. 130; *Jenyns, Zool. Beagle, Fishes*, p. 72.
Elagatis bipinnulatus, *Benn. Whaling Voyage*, ii. p. 283.
Seriolichthys bipinnulatus, *Bleek. Natuurk. Tydschr. Nederl. Ind.* vi. p. 196.

B. 7. D. $6 \mid \frac{1}{25} \mid$ I. A. $2 \mid \frac{1}{18} \mid$ I.

Each finlet is composed of two rays. The height of the body is five times in the total length, the length of the head $4\frac{2}{3}$; the upper maxillary reaches to the vertical from the anterior margin of the eye. Body with two blue longitudinal bands.

Sea of Batavia; Amboyna; Keeling Islands; New Guinea.

a. Half-grown. Amboyna. Purchased of Mr. Frank.

9. NAUCLERUS.

Nauclerus, *Cuv. & Val.* ix. p. 247.

Body oblong, compressed, covered with very small scales; cleft of the mouth narrow. The first dorsal continuous, with three to five short spines; the second dorsal and the anal are much more developed, without separate finlets; two spines before the anal, rather remote from the remainder of the fin. The lateral line is not armed. *The teeth in the jaws form villiform bands,* with some stronger ones anteriorly; teeth on the vomer and the palatine bones. *A more or less distinct spine at the angle of the præoperculum.* Branchiostegals seven; air-bladder present. Pyloric appendages numerous.

Small fishes, inhabiting the high seas between the tropics in both hemispheres. The species are little known.

1. Nauclerus compressus.

Cuv. & Val. ix. p. 249. pl. 263.

B. 7. D. $5 \mid \frac{1}{25}$. A. $2 \mid \frac{1}{16}$.

The height of the body equals the length of the head, and is one-fourth of the total; the width of the interocular space equals that of the eye. Præoperculum with a strong spine at the angle, and with a smaller one above and below. The height of the spinous dorsal is one-ninth of that of the body; the ventrals do not extend to the vent. Body with seven blackish cross-bands, disappearing on the belly; the fourth, fifth and sixth extend on the soft dorsal, and the two latter on the anal, forming spots; each caudal lobe with a blackish spot; ventrals black. (*Cuv.*)

Molucca Sea.

2. Nauclerus abbreviatus.

Cuv. & Val. ix. p. 251; *Lowe, Proc. Zool. Soc.* 1840, p. 36, and *Trans. Zool. Soc.* iii. p. 3.

D. $4 \mid \frac{1}{25}$. A. $2 \mid \frac{1}{15}$.

Præoperculum with four spines; suprascapula with a strong spine. The height of the spinous dorsal is one-ninth of that of the body. Body with seven blackish cross-bands, disappearing on the belly; the fourth, fifth and sixth extend on the soft dorsal, and the two latter on the anal, forming spots; ventrals black.

Atlantic.

a–d. North Atlantic. Presented by J. B. Godfrey, Esq.

3. Nauclerus brachycentrus.

Cuv. & Val. ix. p. 252.

D. $4 \,\Big|\, \frac{1}{25}$. A. $2 \,\Big|\, \frac{1}{15}$.

The height of the spinous dorsal is one-fifteenth only of that of the body. Præoperculum with a single very short spine at the angle. Body with seven blackish cross-bands, disappearing on the belly; caudal with a band. (*Cuv.*)

Indian Ocean or Molucca Sea.

4. Nauclerus triacanthus.

Cuv. & Val. ix. p. 253.

D. $3 \,\Big|\, \frac{1}{25}$. A. $2 \,\Big|\, \frac{1}{19}$.

Præoperculum with a very short spine at the angle; the bands on the back disappear on the sides; caudal with two deep-black spots. (*Cuv.*)

Atlantic.

5. Nauclerus annularis.

Cuv. & Val. ix. p. 254.

D. $4 \,\Big|\, \frac{1}{27}$. A. $2 \,\Big|\, \frac{1}{14}$.

Body with six black cross-bands encircling the belly, and united with those of the other side; caudal with a small blackish spot. (*Cuv.*)

Atlantic between St. Helena and the Cape. (Gulf of Bengal.)

6. Nauclerus leucurus.

Cuv. & Val. ix. p. 255.

D. $5 \,\Big|\, \frac{1}{26}$. A. $2 \,\Big|\, \frac{1}{15}$.

The body is higher than in *N. compressus.* Bands of the body narrow; caudal without any spot. (*Cuv.*)

Atlantic between St. Helena and the Cape.

10. PORTHMEUS.

Porthmeus, *Cuv. & Val.* ix. p. 255.

Body oblong, compressed, naked; cleft of the mouth wide, with the lower jaw prominent. The two dorsals continuous at the base, and separated by a notch; no separate finlets; anal fin with three spines, the two anterior ones rather separate. Lateral line without any armature. Small teeth in the jaws, on the vomer and the palatine bones. Præoperculum serrated. Branchiostegals seven; air-bladder present. Pyloric appendages numerous.

A genus but little known. From the Indian Ocean and the Cape of Good Hope.

1. Porthmeus argenteus.

Cuv. & Val. ix. p. 256. pl. 264.

D. $7 \left| \frac{1}{20} \right.$. A. $\frac{3}{19}$.

A ciliated crest above the orbit. The height of the body is one-fourth of the total length, the length of the head one-third. Snout very pointed. Body with blackish vertical bands. (*Cuv.*)

Indian Ocean; Cape of Good Hope.

11. CHORINEMUS*.

Scomberoides, *Lacép.*
Chorinemus, *Cuv. & Val.* viii. p. 367.

Body compressed, oblong; cleft of the mouth moderate or wide. Dermal productions small, lanceolate, hidden in the skin. Two dorsals: the first formed by free spines in small number; the posterior rays of the second dorsal and of the anal fin detached or semi-detached, penicillated. Two anal spines, separated from the soft portion. Small teeth in the jaws, on the vomer and the palatine bones. Branchiostegals seven (eight); pseudobranchiæ present; air-bladder bifurcate posteriorly. Pyloric appendages in great number.

Tropical parts of the Atlantic; Indian Ocean and Archipelago.

1. Chorinemus lysan.

? *Dampier, Voy. New Holland,* i. pl. 3. f. 5. p. 162.
Scomber lysan, *Forsk.* no. 67. pl. 54.
—— forsteri, *Bl. Schn.* p. 26.
Scomberoides commersonianus, *Lacép.* ii. pl. 20. f. 3.
Russell, ii. p. 31. pl. 141.
Scomber madagascariensis, *Shaw, Zool.* iv. p. 590. pl. 85; *Bennett, Life of Raffles,* p. 689.
Lichia lysan, *Rüpp. Atl. Fische,* p. 91.
Chorinemus commersonianus, *Cuv. & Val.* viii. p. 370; *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 44.
—— lyzan, *Cuv. & Val.* viii. p. 387; *Rüppell, N. W. Fische,* p. 44; *Cantor, Catal.* p. 118.
? Chorinemus farkharii, *Cuv. & Val.* viii. p. 388.
Chorinemus aculeatus, *Cuv. & Val.* viii. p. 384 (not *Bloch*).
—— forsteri, *Richards. Ann. & Mag. Nat. Hist.* 1843, xi. p. 24.

B. 8. D. $7 \left| \frac{1}{19} \right.$. A. $2 \left| \frac{1}{18} \right.$. Vert. $\frac{10}{16}$.

The height of the body is four times in the total length, the length of the head $5\frac{1}{2}$. The upper maxillary is very slightly widened and rounded posteriorly, and reaches far beyond the vertical from the posterior margin of the eye. The length of the intermaxillary is more than one-half that of the head; the snout is obtuse, and about as long as the diameter of the eye. A series of six or eight large round brown spots above the lateral line.

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* 1. Chorinemus exoletus, (*Ehrenb.*) *Cuv. & Val.* viii. p. 379.—Red Sea.
2. —— lanceolatus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1858, p. 168.—Texas.
3. —— tol, *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 43 (not *Cuv.*).—Batavia.
4. —— leucophthalmus, *Richards. Ichth. China,* p. 269.—Canton.
5. —— delicatulus, *Richards. l. c.*—Chinese Seas.

From the Red Sea to the N.W. coast of Australia.

? *a*. Half-grown: not good state. N.W. Australia. From the Haslar Collection.

b. Adult: stuffed. Port Essington. Presented by J. Gould, Esq.

c. Young. China. Presented by J. R. Reeves, Esq.

d. Young: stuffed. China. From Dr. Cantor's Collection.

e. Half-grown. India. Presented by G. R. Waterhouse, Esq., as *Chorinemus aculeatus*.

f–i. Adult, half-grown, and young: skins. Malayan Peninsula. From Dr. Cantor's Collection.

k. Adult. From the Haslar Collection.

l. Thirty inches long: stuffed: not good state.

m. Thirty-five inches long: stuffed. From the Collection of the East India Company.

n. Half-grown: skeleton. From the Haslar Collection.

The *air-bladder* extends far backwards on each side of the hæmal spines.

Skeleton.—There are several strong crests on the upper part of the skull: the occipital crest is continued on to the anterior extremity of the frontal bones; the lateral crests are moderately elevated, and proceed from the superciliary margin. The basal portion of the brain-capsule is slightly compressed. The head of the vomer is flat and ovate, with a patch of minute villiform teeth. The palatine and pterygoid bones are provided with bands of similar teeth. The maxillary and intermaxillary are elongate and narrow; the latter has the posterior processes very short. The mandibula is rather low, smooth, without ridges or a muciferous channel. The præoperculum has two very low ridges; its inferior limb is exceedingly short. The operculum is higher than wide, irregularly quadrangular. The suboperculum is longer than the interoperculum. The suprascapula is suspended to the skull by two strong processes; the scapula is oblong. The humerus forms a deep cavity with the ulna; there is a wide slit between both bones; the radius has a round foramen. The pubic bones are rather small; each is composed of four lamellæ.

There are ten abdominal and sixteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·8. Each of the vertebræ has a deep lateral impression. The neural and hæmal spines are rather strong, those of the abdominal vertebræ being laterally compressed. There are four spurious interneural spines, each of which has an acute point directed forwards; the posterior is the strongest, and its point can be observed externally; the other interneurals are rather feeble. The first interhæmal is exceedingly strong, its lower half being bent forwards; the other interhæmals are dilated and transparent. The ribs are well developed and rather stout.

2. Chorinemus tala.

? Tala-parah, *Russell*, ii. pl. 140.
Chorinemus tala, *Cuv. & Val.* viii. p. 377.

$$\mathrm{D}.\ 7 \,\Big|\, \frac{1}{19}.\qquad \mathrm{A}.\ 2 \,\Big|\, \frac{1}{18}.$$

The height of the body is four times in the total length, the length of the head 5½. The upper maxillary is somewhat widened posteriorly and triangular; it reaches to the vertical from the posterior margin of the eye. The snout is obtuse, and about as long as the diameter of the eye. An indistinct series of spots along the side. (*Cuv.*)

Coast of Malabar.

3. Chorinemus toloo.

Toloo parah, *Russell*, ii. p. 29. pl. 137.
Lichia toloo-parah, *Rüpp. Atl. Fische*, p. 91.
Chorinemus toloo, *Cuv. & Val.* viii. p. 377; ? *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 45.

$$\mathrm{D}.\ 7 \,\Big|\, \frac{1}{19}.\qquad \mathrm{A}.\ 2 \,\Big|\, \frac{1}{18}.$$

The height of the body is four times in the total length, the length of the head 5½. The upper maxillary does not reach to the vertical from the posterior margin of the eye. The snout is obtuse, and about as long as the diameter of the eye. A series of more or less distinct greyish spots along the side of the body; the top of the dorsal and anal fins and the lobes of the caudal blackish.

From the Red Sea to the East Indies.

4. Chorinemus tol.

Tol Parah, *Russell*, ii. p. 29. pl. 138 (bad).
Chorinemus tol, *Cuv. & Val.* viii. p. 385 (not *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 43, or *Cant.*).

$$\mathrm{D}.\ 7 \,\Big|\, \frac{1}{20}.\qquad \mathrm{A}.\ 2 \,\Big|\, \frac{1}{19}.$$

The height of the body is 5½ in the total length, the length of the head six times. *The upper maxillary reaches to below the anterior margin of the eye.* A series of darker spots on the sides; a bluish streak above the operculum; top of the dorsal black, of the caudal blackish. (*Cuv.*)

East Indian Seas.

5. Chorinemus sancti Petri.

? Conings-visch, *Nieuhof, Bras. Zee- en Lant-Reize*, p. 269.
Renard, Poiss. Mol. i. 15. 86; *Valent.* iii. p. 351. f. 11.
Scomber, sp., *Gronov. Zoophyl.* no. 305.
Chorinemus sancti Petri, *Cuv. & Val.* viii. p. 379. pl. 236; *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 45; *Peters, Wiegm. Arch.* 1855, p. 245.
—— moadetta, *Cuv. & Val.* viii. p. 382; *Rüpp. N. W. Fische*, p. 45.
—— mauritianus, *Cuv. & Val.* viii. p. 382.

Chorinemus tol, *Cantor, Catal.* p. 119 (not *Cuv.*).
Thynnus moluccensis, *Gronov. Syst. ed. Gray*, p. 121.

D. $7 \mid \frac{1}{20-21}$. A. $2 \mid \frac{1}{18-19}$. Vert. 10/16.

The height of the body is nearly equal to the length of the head, and one-fifth of the total. The upper maxillary is triangular and flat posteriorly, and reaches beyond the vertical from the centre of the eye. The length of the intermaxillary is contained one and two-third times or twice in that of the head. The snout, in mature fishes, is nearly twice as long as the diameter of the eye. A series of rounded, indistinct blackish spots above the lateral line, sometimes a second row beneath, sometimes both absent. An indistinct blackish streak from above the eye to the shoulder. Top of the dorsal black.

From the eastern shores of Africa through all the East Indian Seas.

a. Half-grown. Madagascar. Presented by Dr. J. E. Gray.
b. Adult: skin. Ceylon. Collected by E. F. Kelaart, M.D.
c. Half-grown. China. Presented by the Honourable East India Company.
d. Half-grown. Amboyna. Purchased of Mr. Frank as *Chorinemus tol.*
e–g. Half-grown: skins. Malayan Peninsula. From Dr. Cantor's Collection.
h. Half-grown.
i. Fine specimen. Purchased of Mr. Frank.
k. Half-grown: skin. From Gronow's Collection.
l. Adult: skeleton. Moluccas.

The *air-bladder* extends far backwards on each side of the hæmal spines.

The *skeleton* is very similar to that of *Ch. lysan*, and differs from it in the following points:—The snout is more produced, and the maxillary does not reach so far backwards; the lateral crests on the upper part of the skull are little developed; the præoperculum has the lower limb not much shorter than the posterior. There are ten abdominal and sixteen caudal vertebræ, the length of the former portion of the vertebral column being to that of the latter as 1:1·9.

6. **Chorinemus orientalis.**

Chorinemus orientalis, *Temm. & Schleg. Faun. Japon. Poiss.* p. 106. pl. 57. f. 1.
? Scomber aculeatus, *Bloch*, taf. 336.

D. $7 \mid \frac{1}{20}$. A. $2 \mid \frac{1}{18}$.

The height of the body is $4\frac{1}{3}$ in the total length, the length of the head five times. The teeth of the outer series of the mandibula are stronger, curved, bent outwards. The snout is about twice as long as the diameter of the eye. Coloration uniform; the top of the dorsal blackish. (*Schleg.*)

Sea of Japan.

7. Chorinemus occidentalis.

Brown, Jamaica, p. 452. pl. 46. f. 2; *Parra,* pl. 12. f. 2.
Gasterosteus occidentalis, *L. Syst.* i. p. 490.
Centronotus argenteus, *Lacép.* iii. p. 316.
Lichia quiebra, *Quoy & Gaim. Voy. Freyc. Zool.* p. 365.
Chorinemus saltans, *Cuv. & Val.* viii. p. 393.
—— quiebra, *Cuv. & Val.* viii. p. 396.

D. $5 \mid \frac{1}{21}$. A. $2 \mid \frac{1}{21}$.

The height of the body is 4–$4\frac{2}{3}$ in the total length, the length of the head $5\frac{3}{4}$; the upper maxillary is very narrow posteriorly, and reaches to, or nearly to, the vertical from the posterior rim of the orbit. The length of the intermaxillary is one-half that of the head. The snout is little longer than the diameter of the eye. The infraorbital, situated above the maxillary, is generally narrower than the bone next above it*; none of these bones reach to the anterior præopercular ridge. Coloration uniform.

Atlantic shores of tropical America.

a–h. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
i, k. Fine specimens. S. Domingo. Purchased of Mr. Cuming.
l. Adult: skin in spirits. Trinidad. Presented by J. B. Richardson, Esq.
m. Half-grown. Puerto Cabello. Purchased of Mr. Brandt.
n. Adult. Bahia. Purchased of M. Parzudaki.
o, p. Adult: stuffed. Bahia.
q. Adult. Old Collection.
r. Adult.
s. Half-grown.
t. Adult stuffed.
u. Half-grown: stuffed.

8. Chorinemus guaribira.

Cuv. & Val. viii. p. 393.

D. $4 \mid \frac{1}{19}$. A. $2 \mid \frac{1}{20}$.

The height of the body is $4\frac{1}{2}$ in the total length, the length of the head $5\frac{1}{2}$. The upper maxillary is very narrow posteriorly, and reaches beyond the vertical from the posterior rim of the orbit. The snout is little longer than the diameter of the eye. The infraorbital bones reach to the anterior præopercular ridge, cuirassing the cheek. Coloration uniform.

Coast of Brazil.

9. Chorinemus saliens.

Scomber saliens, *Bl.* taf. 335; *Bl. Schn.* p. 25.
Scomberoides saltator, *Lacep.* ii. pl. 19. f. 2.

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* In some of the specimens it is broader, as in *Ch. saliens.*

Chorinemus saliens, *Cuv. & Val.* viii. p. 389.
—— palometa, *Cuv. & Val.* viii. p. 392.

B. 7. D. $4 \,|\, \frac{1}{19}$. A. $2 \,|\, \frac{1}{20}$. Vert. 10/15.

The height of the body is $4\frac{1}{2}$, the length of the head $5\frac{1}{2}$ in the total. The upper maxillary is very narrow posteriorly, and reaches beyond the vertical from the posterior rim of the orbit. The length of the intermaxillary is one-half that of the head. The snout is little longer than the diameter of the eye. The infraorbital, situated above the maxillary is broader than the bone next above it; none of these bones reach to the anterior præopercular ridge. Coloration uniform.

Atlantic coasts of tropical America.

Var. *Ch. saliens*, Cuv. The posterior margin of the infraorbital ring is nearly vertical.

a. Stuffed: 2 feet long.

Var. *Ch. palometa*, Cuv. The posterior margin of the infraorbital ring is deeply concave.

b. Adult. Lake of Maracaibo. Purchased of Mr. Brandt.

12. LICHIA.

Lichia, *Cuv. Règne Anim.*; *Cuv. & Val.* viii. p. 340.
Lichia et Temnodon, sp., *Lowe, Proc. Zool. Soc.* 1850, p. 248.

Body compressed, oblong, covered with minute scales; cleft of the mouth moderate; forehead not prominent. Two dorsals: the first formed by free spines in small number, and with an anterior horizontal spine pointing forwards. Two anal spines, separated from the soft portion. No finlets. Small teeth in the jaws (in *L. vadigo* of moderate size), on the vomer and the palatine bones. Pseudobranchiæ absent. Eight or nine branchiostegals; air-bladder bifurcate posteriorly. Pyloric appendages in great or moderate number.

Mediterranean; Atlantic, between Africa and Brazil; coast of Chile.

1. Lichia amia.

Secunda Glauci species, *Rondel.* p. 254; *Aldrov.* p. 303.
Amia, *Salv.* f. 121; *Willughby*, p. 296.
Glaucus primus, *Ray*, p. 94.
Scomber, no. 4, *Artedi, Genera*, p. 31 (not synon.).
—— amia, *L. Syst. Nat.* i. p. 495; *Bl. Schn.* p. 34.
Caranx amia, *Lacép.* iii. p. 65.
Centronotus vadigo, *Lacép.* iii. p. 318.
—— lyzan, *Lacép.* iii. p. 316; *Risso, Ichth. Nice*, p. 195, and *Eur. Mérid.* iii. p. 430.
Lichia amia, *Cuv. Règne Anim.*; *Martens, Reise nach Venedig*, ii.

p. 434; *Cuv. & Val.* viii. p. 348; *Cuv. Règne Anim. Ill. Poiss.* pl. 54. f. 3.
Skeleton: *Agass. Rech. Poiss. Foss.* v. p. 33. pl. C.*

D. $7 \left| \frac{1}{21} \right.$. A. $2 \left| \frac{1}{21} \right.$. Vert. 10/14.

The height of the body is one-fourth of the total length (to the middle of the fork of the caudal); the upper maxillary reaches somewhat beyond the vertical from the posterior rim of the orbit. The lateral line makes a semicircular curve above the pectoral. Coloration uniform: young specimens with seven or eight blackish bars across the back.

Mediterranean; western coasts of Africa to the Cape of Good Hope.

a. Three feet long: stuffed.
b. Adult: stuffed. Cape of Good Hope. Purchased of Mr. Frank.
c. Forty-two inches long: stuffed. Cape Seas. From Sir A. Smith's Collection.
d. Half-grown: stuffed: not good state. Algoa Bay. From Sir A. Smith's Collection.

2. **Lichia glauca.**

Prima Glauci species, *Rondel.* p. 252; *Willughby*, p. 297.
Lampuge, *Bellon.* p. 155.
Scomber, no. 5, *Artedi, Genera*, p. 52.
—— glaucus, *L. Syst. Nat.* i. p. 494; *Bl. Schn.* p. 33; *Shaw, Zool.* iv. p. 593.
Gasterosteus glaucus, (*Forst.*) *Bl. Schn.* p. 539; *Forst. Descript. Anim. cur. Lichtenst.* p. 5.
Caranx glaucus, *Lacép.* iii. pp. 58, 66.
Centronotus glaycos, *Risso, Ichth. Nice*, p. 194.
Lichia glaucus, *Risso, Eur. Mérid.* iii. p. 429; *Cuv. & Val.* viii. p. 358. pl. 234; *Webb & Berthel. Iles Canar.* p. 56. pl. 13. f. 1; *Yarrell, Brit. Fishes*, edit. 3. ii. p. 232.

D. $5\text{–}6 \left| \frac{1}{24\text{–}27} \right.$. A. $2 \left| \frac{1}{23\text{–}24} \right.$. Cæc. pylor. 13–16. Vert. 10/14.

The height of the body is $2\frac{2}{3}$–$2\frac{3}{4}$ in the total length (to the middle of the fork of the caudal); the upper maxillary reaches to, or slightly beyond, the vertical from the anterior rim of the orbit. The lateral line is very little bent above the pectoral. Coloration uniform, sometimes with indistinct vertical spots on the side; the top of the dorsal and anal fins deep black.

Mediterranean; Atlantic, from Gibraltar to the coasts of Brazil and to the Cape of Good Hope.

a, b. Adult and half-grown. Mediterranean.
c. Fine specimen. Madeira. Presented by the Lords of the Admiralty.
d. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.
e. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.
f. Fine specimen. Madeira. From the Haslar Collection.

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* This figure is erroneously named *Lichia glaucus* in the explanation of the plates: it is *Lichia amia*, from the Mediterranean.

g. Adult. Senegal.
h. Half-grown: stuffed. Cape Seas. From Sir A. Smith's Collection.
i, *k*. Half-grown. India. Presented by General Hardwicke.
l. Half-grown. From the Haslar Collection.
m. Half-grown: bad state.
n–p. Half-grown.
q. Adult: skeleton.

Pseudobranchiæ none.

The *skeleton* shows a great similarity to that of *Chorinemus*: there is a high occipital crest extending on to the anterior extremity of the frontal bones; the two lateral crests are well developed, the interior proceeding from the anterior angle of the orbit, the exterior from the superciliary margin. The basal portion of the brain-capsule is rather compressed, and the basisphenoid has a prominent process on each side, immediately before the occipital joint. The head of the vomer is flat, and armed with a subquadrangular patch of minute villiform teeth; the palatine bones have a narrow band, but the pterygoids are destitute of teeth. The posterior portion of the maxillary is rather broad; the intermaxillary is feeble, with a slight prominence behind, and with the posterior processes of moderate length. The mandibula has neither ridge nor muciferous channel, and there is a very narrow slit between the dentary and the articular bone. The præoperculum is flat and smooth, with the interior ridge very depressed; its lower limb is shorter than its posterior. The operculum is not quite twice as high as wide, and has a slight notch in its posterior margin. The suboperculum is shorter than the interoperculum. The pubic bones are little developed and slender; each is composed of four very narrow laminæ.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·5. The neural and hæmal spines are rather stout, and those of the abdominal portion laterally compressed. There are four spurious interneurals, each of which terminates superiorly in a spine directed forwards; the fourth is the strongest, and its spine can be seen externally. The first interhæmal is strong, inferiorly dilated in a triangular process, pointing forwards; it is firmly joined to the first hæmal spine. The other interneurals and interhæmals are dilated, thin, and transparent.

3. Lichia vadigo.

Tertia Glauci species, *Rondel.* p. 255.
Centronotus glaycos, *Lacép.* iii. p. 315.
—— vadigo, *Risso, Ichth. Nice*, p. 196.
Lichia vadigo, *Risso, Eur. Mérid.* iii. p. 430; *Cuv. & Val.* viii. p. 363. pl. 235.
Temnodon vadigo, *Lowe, Proc. Zool. Soc.* 1850, p. 248.

$$\text{B. } 8. \quad \text{D. } 7 \Big| \frac{1}{29\text{–}32}. \quad \text{A. } 2 \Big| \frac{1}{23\text{–}24}.$$

The height of the body is one-fourth of the total length; the upper maxillary reaches to the vertical from the posterior margin of the eye. The lateral line is slightly bent above the pectoral. The teeth in the jaws form a single series. The dark colour of the back extends on the sides and forms a series of about twenty vertical blotches.

Mediterranean; Sea of Madeira.

a. Twenty-seven inches long: stuffed. Madeira. From the Rev. R. T. Lowe's Collection.

4. Lichia calcar.

Scomber calcar, *Bloch*, taf. 336. f. 2; *Bl. Schn.* p. 27.
Centronotus calcar, *Lacép.* iv. p. 713.
Lichia calcar, *Cuv. & Val.* viii. p. 366.

$$\text{D. } 3 \,\Big|\, \frac{1}{20}. \quad \text{A. } 2 \,\Big|\, \frac{1}{21}.$$

The height of the body is $3\frac{1}{4}$ in the total length; ventrals rather small. Coloration uniform.

A doubtful species from the coast of Guinea: perhaps a bad representation of *Chorinemus saliens*.

5. Lichia albacora.

Guich. in Gay, Hist. Chil. Zool. ii. p. 231.

The first dorsal with three spines only; ventrals long and pointed. Coloration uniform. (*Guich.*)

Coast of Chile.

13. TEMNODON.

Temnodon, *Cuv. & Val.* ix. p. 225.

Body oblong, compressed, covered with cycloid scales of moderate size; cleft of the mouth rather wide. *Jaws with a series of strong teeth*; teeth on the vomer and the palatine bones. Præoperculum with some slight denticulations. The first dorsal with eight feeble spines, continuous; the second and the anal are more developed, covered with scales, without detached finlets; there are one or two small spines before the anal. Lateral line not armed or shielded. Branchiostegals seven; air-bladder simple. Pyloric appendages in great number.

Inhabitants of nearly all the temperate and tropical seas.

1. Temnodon saltator.

Skipjack, *Catesby, Hist. Nat. Carol.* ii. p. 14. t. 14.
Gasterosteus saltatrix, *L. Syst. Nat.* i. p. 491; *Shaw, Zool.* iv. p. 609.
Scomber saltator, *Bl. Schn.* p. 35.
Pomatomus skib, *Lacép.* iv. p. 436. pl. 8. f. 3.
Chilodipterus heptacanthus, *Lacép.* iii. p. 542. pl. 21. f. 3 (bad).
Scomber plumbeus, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 424. pl. 4. f. 1.

Temnodon heptacanthus, *Quoy & Gaim. Voy. Freyc. Zool.* p. 400. pl. 61. f. 2 (bad).

—— saltator, *Cuv. & Val.* ix. p. 225. pl. 260; *Cuv. Règne Anim. Ill. Poiss.* pl. 56. f. 3; *Storer, Report,* p. 57; *Dekay, New York Fauna, Fishes,* p. 130. pl. 26. f. 81; *Baird, Ninth Smithson. Report,* p. 337; *Webb & Berthel. Hist. Nat. Iles Canar. Ichthyol.* p. 58. pl. 26. f. 2; *Holbr. Ichthyol. S. Carol.* p. 62. pl. 9. f. 2; *Gay, Hist. Chil. Zool.* ii. p. 244; *Lowe in Trans. Zool. Soc.* ii. p. 183; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 394; *Guichen. Explor. Algér. Poiss.* p. 63; *Webb & Berthel. Iles Canar. Poiss.* p. 58. pl. 13. f. 2.

D. $8\,\Big|\,\frac{1}{24\text{–}26}$. A. $1\text{–}2\,\Big|\,\frac{1}{26\text{–}28}$. L. lat. 90–100. L. transv. $\frac{8}{19}$. Vert. 12/14.

The maxillary reaches to, or nearly to, the vertical from the posterior margin of the eye. Præoperculum with a notch above the angle, and with slight denticulations along the lower limb. Dorsal spines very feeble. Coloration uniform.

Inhabits nearly all the seas of the tropical and temperate regions.

a. Adult. Lanzarote. Presented by the Rev. R. T. Lowe.
b. Half-grown. New York. Purchased of Mr. Brandt.
c. Adult. South America.
d. Half-grown. Cape Seas.
e. Half-grown: not good state. Molucca Sea.
f. Half-grown. Australia. Presented by the Earl of Derby.
g. Adult: stuffed. Australia. Purchased of Mr. Cuming.
h–k. Young. Australia. From Mr. Gould's Collection.
l. Twenty-five inches long: stuffed. Swan River.
m. Half-grown. Port Jackson. Presented by the Lords of the Admiralty.
n. Adult.
o. Adult.
p. Adult: stuffed.
q. Adult: skin. From Gronow's Collection.
r. Half-grown: not good state.

14. TRACHYNOTUS[*].

Trachinotus, (*Lacép.*) *Cuv. & Val.* viii. p. 398.

Body compressed, more or less elevated, covered with very small scales; cleft of the mouth rather small, with the muzzle above swollen, obtuse. Opercles entire. Two dorsals: the first composed of free spines in small number, and with an anterior horizontal spine directed forwards. Two anal spines, separated from the soft portion. No finlets. Small teeth in the jaws, on the vomer and the palatine bones, generally lost with age. Seven branchiostegals; pseudobranchiæ none; air-bladder bifurcate posteriorly. Pyloric appendages in considerable or moderate number.

Atlantic, between Africa and America; Indian Seas.

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[*] 1. Trachinotus marginatus, *Cuv. & Val.* viii. p. 411.—Montevideo.
2. —— paytensis, *Cuv. & Val.* viii. p. 438.—Port de Paita.

1. Trachynotus ovatus

Gasterosteus ovatus, *L. Syst. Nat.* i. p. 490.
Centronotus ovalis, *Lacép.* iii. pp. 309, 316.

A. *Synonymy of the Atlantic specimens.*

Chætodon rhomboides, *Bloch*, taf. 209.
Acanthinion rhomboides, *Lacép.* iv. p. 500.
Spinous Dory, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. pl. 6. f. 10.
Trachinotus rhomboides, *Cuv. & Val.* viii. p. 407; *Guichen. Poiss. in Ramon de la Sagra, Hist. Cuba*, p. 108.
—— fuscus, *Cuv. & Val.* viii. p. 410.
—— teraia, *Cuv. & Val.* viii. p. 418.
—— spinosus, *Dekay, New York Fauna, Fishes*, p. 117. pl. 19. f. 53 (bad).
Lichia spinosa, *Baird, Ninth Smithson. Report*, p. 336.
Doliodon spinosus, *Girard, Proc. Acad. Nat. Sc. Philad.* 1858, p. 168.

B. *Synonymy of the Indian specimens.*

Valent. iii. p. 386. f. 118; *Renard*, i. 27. 151.
Scomber falcatus, *Forsk.* p. 57.
Cæsiomorus blochii, *Lacép.* iii. p. 95. pl. 3. f. 2.
Trachinotus falcatus, *Lacép.* iii. p. 79; *Rüpp. Atl. Fische*, p. 89; *Cuv. & Val.* viii. p. 430.
Mookalee-parah, *Russell*, ii. p. 39. pl. 154.
Trachinotus mookalee, *Cuv. & Val.* viii. p. 423; *Cantor, Catal.* p. 120; *Bleeker, Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 48.
—— blochii, *Cuv. & Val.* viii. p. 425.
—— affinis, *Cuv. & Val.* viii. p. 428.
—— falciger, *Cuv. & Val.* viii. p. 428.
—— drepanis, *Cuv. & Val.* viii. p. 429.
—— auratus, *Richards. Ichth. Chin.* p. 270.

$$\text{D. } 6 \left| \frac{1}{18\text{–}21}. \quad \text{A. } 2 \right| \frac{1}{16\text{–}19}.$$

The height of the body is 2–2⅓ in the total length, the length of the head 5–5¼, one of the caudal lobes 3½–4 times. The anterior rays of the dorsal and anal more or less produced. Coloration uniform; the dorsal, caudal, and anal lobes blackish or black.

Atlantic coasts of tropical and temperate America, crossing the ocean to the west coast of Africa; Indian Ocean and Archipelago to the coast of Australia.

This species belongs to those *Carangidæ* which inhabit the seas of both hemispheres. The British Museum possesses specimens from the Atlantic and the Indian Oceans, in which not the slightest difference can be detected. The specimens differ in the length of the lobes of the fins, and in the height of the body, chiefly according to their age. Old specimens gradually lose the teeth*, and the anterior profile of the snout is entirely vertical, whilst it inclines slightly backwards in immature fish. I suppose that the other species of *Trachynotus* undergo similar changes.

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* See *Cantor, Catal.* p. 121, and *Bleeker, Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 48.

A. *American specimens.*

I. Jaws toothless.

a. Very fine specimen: 12 inches long and 6 high. St. Domingo. Purchased of Mr. Cuming.

II. Jaws toothed, and the length of a caudal lobe $3\frac{1}{2}$ in the total: *Trachynotus rhomboides*, Cuv.

b. Adult. South America. Presented by Sir R. Schomburgk.
c–f. Half-grown: skins. Jamaica. From Dr. Parnell's Collection.

III. Jaws toothed, and the length of a caudal lobe one-fourth of the total: *Trachynotus fuscus*, Cuv.

g. Half-grown: skin. West Indies.
h. Half-grown. West Indies. Purchased of Mr. Scrivener.

B. *Indian specimens.*

I. Jaws toothless.

i. Adult: skin. Malayan Peninsula. From Dr. Cantor's Collection.
k. Sixteen inches long. Ceylon. Collected by E. F. Kelaart, M.D.
l. Adult: stuffed.

II. Jaws toothed, with the dorsal and anal lobes reaching to the middle of the caudal: *Trachynotus falciger*, Cuv.

m, n. Adult. Old Collection.
o. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

III. Jaws toothed, with the dorsal and anal lobes reaching to the root of the caudal: *Trachynotus falcatus*, Cuv.

p. Fine specimen. Red Sea.
q. Fine specimen. Amboyna. Purchased of Mr. Frank.

IV. Jaws toothed; the dorsal and anal lobes reaching to, or beyond, the middle of the fins: *Trachynotus mookalee*, Cuv.

r. Half-grown. Moluccas. Purchased of Mr. Frank.
s. Half-grown. Pinang. Presented by General Hardwicke.
t. Half-grown: skin. India. Presented by B. H. Hodgson, Esq.

V. Jaws toothed; the dorsal and anal lobes not reaching to the middle of the fins: *Trachynotus affinis*, Cuv.

u, v. Half-grown. China.
w. Half-grown.
x. Young: skin. Sea of Pinang. From Dr. Cantor's Collection.

C. *Australian specimens.* The palatine teeth forming a long strip; the dorsal and anal lobes reach nearly to the end of the fins.

y. Half-grown. Australia. Purchased of Mr. Dring.

2. Trachynotus goreensis.

Trachinotus goreensis, *Cuv. & Val.* viii. p. 419.
? Trachinotus maxillosus, *Cuv. & Val.* viii. p. 420 (adult ?).

$$\text{D. } 6 \left| \tfrac{1}{19\text{–}22}. \right. \quad \text{A. } 2 \left| \tfrac{1}{18}. \right.$$

The height of the body is $2\frac{3}{4}$ in the total length, the length of the head $4\frac{1}{2}$, one of the caudal lobes four times. The snout is obliquely truncated; the upper maxillary reaches nearly to below the centre of the eye. The anterior rays of the dorsal and anal extend beyond the middle of the fins, if laid backwards. The dorsal, caudal, and anal lobes black.

West coast of Africa; Caribbean Sea.

a. Half-grown. Niger Expedition. From Mr. Fraser's Collection.
b. Half-grown: skin. Jamaica. From Dr. Parnell's Collection.
c. Half-grown: skin. West Indies.

3. Trachynotus glaucus.

Chætodon glaucus, *Bl.* taf. 210.
Acanthinion glaucum, *Lacép.* iv. p. 500.
Trachinotus glaucus, *Cuv. & Val.* viii. p. 400; *Guichen. Poiss. in Ramon de la Sagra, Hist. Cuba*, p. 107.

$$\text{D. } 6 \left| \tfrac{1}{19}. \right. \quad \text{A. } 2 \left| \tfrac{1}{17}. \right. \quad \text{Cæc. pylor. 13.} \quad \text{Vert. 10/14.}$$

The height of the body is nearly three times in the total length, the length of the head $5\frac{1}{3}$, one of the caudal lobes three times. The anterior rays of the dorsal and anal reach to or beyond the middle of the caudal fin, if laid backwards (shorter in immature specimens). Silvery, with four blackish vertical streaks on the side of the back.

Atlantic shores of tropical America.

a. Adult. Antilles. Purchased of Mr. Brandt.
b. Half-grown. Rio de Janeiro. Presented by A. Fry, Esq.
c. Adult: stuffed. South America.
d. Adult: stuffed. West Indies.
e. Adult: skin. Jamaica. From Dr. Parnell's Collection.
f. Adult: not good state. From the Haslar Collection.
g. Large specimen. Old Collection, as *Scomber macropterus*.
h. Half-grown: bleached. Old Collection, as *Gasterosteus ovatus*, L.

4. Trachynotus myrias.

Cuv. & Val. viii. p. 421.

$$\text{D. } 6 \left| \tfrac{1}{24}. \right. \quad \text{A. } 2 \left| \tfrac{1}{20}. \right.$$

The height of the body is $2\frac{1}{4}$ in the total length, the length of the head five, one of the caudal lobes four times. The upper profile of the head forms a quarter of a circle. The dorsal and anal lobes reach beyond the base of the caudal, if laid backwards. A series of five blackish spots along the lateral line. (*Cuv.*)

West coast of Africa.

5. **Trachynotus pampanus.**

Trachinotus pampanus, *Cuv. & Val.* viii. p. 415. pl. 237.
—— argenteus, *Cuv. & Val.* viii. p. 413, cop. by *Dekay, New York Fauna, Fishes,* p. 116.
—— cupreus, *Cuv. & Val.* viii. p. 414.
Lichia carolina, *Dekay, New York Fauna, Fishes,* p. 114. pl. 10. f. 30.
Bothrolæmus pampanus, *Holbr. Ichth. S. Carol.* p. 81. pl. 11. f. 2.
Doliodon carolinus, *Girard, Proc. Acad. Nat. Sc. Philad.* 1858, p. 168.

D. 5–6 | $\frac{1}{24-25}$. A. 2 | $\frac{1}{21-22}$. Cæc. pylor. 12–14.

The height of the body is contained two and two-thirds to three times in the total length, the length of the head five times and one-third, one of the caudal lobes four times. The anterior rays of the dorsal and anal reach to the middle of the fin, if laid backwards. Coloration uniform.

Atlantic coasts of America.

a, b. Adult: skins. Jamaica. From Dr. Parnell's Collection.
c. Adult. From the Haslar Collection.

6. **Trachynotus baillonii.**

Russell, ii. pl. 142.
Cæsiomorus bailloni, *Lacép.* iii. p. 93. pl. 3. f. 1.
—— quadripunctatus, *Rüpp. Atl. Fische,* p. 90. pl. 24. f. 1.
Trachinotus bailloni, *Cuv. & Val.* viii. p. 431; *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 46.
—— quadripunctatus, *Cuv. & Val.* viii. p. 434; *Cantor, Catal.* p. 122.
—— russelii, *Cuv. & Val.* viii. p. 436.

D. 6 | $\frac{1}{22}$. A. 2 | $\frac{1}{22}$.

The height of the body is $3\frac{1}{3}$ in the total length, the length of the head five times, one of the caudal lobes $3\frac{1}{3}$. The anterior rays of the dorsal reach beyond the middle of the fin, if laid backwards; the anterior rays of the anal reach to, or somewhat beyond the end of the anal. A series of three or five black dots along the lateral line, which is nearly straight. Dorsal, caudal, and anal lobes black.

Indian Ocean.

a. Fine specimen. Purchased of Mr. Frank.
b. Fine specimen. India. Presented by General Hardwicke.
c. Adult: skin. Malayan Peninsula. From Dr. Cantor's Collection.
d. Fine specimen. Tanna. From the Museum of Economic Geology.
e. Half-grown: bad state. Old Collection.

7. **Trachynotus oblongus.**

Cuv. & Val. viii. p. 437.

D. 6 | $\frac{1}{23}$. A. 2 | $\frac{1}{20}$.

The height of the body is $3\frac{1}{2}$ in the total length, the length of the head five times, one of the caudal lobes $4\frac{1}{2}$. The anterior rays of the dorsal and anal reach to, or somewhat beyond, the middle of the fins. Dorsal, caudal, and anal lobes blackish; sometimes a series of indistinct blackish dots along the lateral line, which is nearly straight.

Seas of Pondicherry, Java, and Sumatra.

a. Sumatra.

8. Trachynotus cayennensis.

Cuv. & Val. viii. p. 417.

$$D.\ 5 \left| \frac{1}{27}. \quad A.\ 2 \right| \frac{1}{26}.$$

The spines of the dorsal and anal not short. The height of the body is about one-third of the total length. (*Cuv.*)

Cayenne.

9. Trachynotus melo.

Trachinotus melo, *Richards. Ichth. Chin.* p. 270.

$$D.\ 6 \left| \frac{1}{19}. \quad A.\ 2 \right| \frac{1}{17}.$$

None of the dorsal rays produced. The height of the body is $2\frac{1}{2}$ in the total length. Coloration uniform.

Chinese and Japanese Seas.

15. PAMMELAS.

Palinurus, *Dekay, New York Fauna, Fishes,* p. 118.

Body compressed, oblong, covered with small cycloid scales; cleft of the mouth of moderate width, with the muzzle above swollen, obtuse. Præ-, inter-, and suboperculum distinctly serrated. Two dorsal fins: the first composed of seven short and free spines; anal with three spines, the first two short, imbedded in the flesh. Finlets none. Teeth of the jaws in a single series; palate smooth*. Branchiostegals seven.

Coast of New York.

1. Pammelas perciformis.

The Rudder-fish, *Mitch. Trans. Lit. & Phil. Soc. New York,* i. pl. 16. f. 7 (without description).

Coryphæna perciformis, *Mitch. Amer. Month. Mag.* ii. p. 244.

Trachinotus argenteus, *Storer, Mass. Report,* p. 55.

Palinurus perciformis, *Dekay, New York Fauna, Fishes,* p. 118. pl. 24. f. 75.

$$D.\ 7 \left| \frac{1}{19}. \quad A.\ 2 \right| \frac{1}{20}. \quad V.\ 1/5.$$

The height of the body is one-third of the total length. Bright bronze-black. (*Dekay.*)

Coast of New York.

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* "No teeth in the pharynx," *Dekay.*

16. PAROPSIS.

Paropsis, *Jenyns, Zool. Beagle, Fishes,* p. 65.

The body is compressed, elevated, covered with very minute teeth; the lateral line without any armature; the cleft of the mouth wide. The spinous dorsal is formed by five short isolated spines; the soft and the anal are much more developed, without detached finlets; two anal spines, separated from the remainder of the fin. Ventrals none. Single series of teeth in the jaws; teeth on the vomer, the palatine bones, and on the tongue. Branchiostegals ten.

East coast of South America.

1. Paropsis signata.

Jenyns, l. c. p. 66. pl. 13.

B. 10. D. $5 \left| \frac{1}{33} \right.$. A. $2 \left| \frac{1}{35} \right.$.

The maxillary reaches to a vertical from the posterior part of the orbit. Uniform silvery; a black patch on the gill-cover, and another under the pectoral fin. (*Jen.*)

Northern coast of Patagonia.

17. PSETTUS.

Psettus, (*Commers.*) *Cuv. & Val.* vii. p. 240.

Body much compressed and elevated; snout rather short. One dorsal, entirely covered with scales, with seven or eight spines; the anal with three; ventrals very small, rudimentary, with a very short spine and some rays. Teeth villiform; no teeth on the palate. Scales small. Six branchiostegals; air-bladder bifurcate posteriorly; pyloric appendages in increased number.

West coast of Africa; all the Indian Seas from the eastern coasts of Africa to Australia and Polynesia.

1. Psettus sebæ.

Seba, iii. 26. 21.
Chætodon rhombeus, *Bl. Schn.* p. 235.
Psettus sebæ, *Cuv. & Val.* vii. p. 241. pl. 183.
Gasterosteus rhombeus, *Forst. Descript. Anim. cur. Lichtenst.* p. 7.

D. $\frac{7-8}{34}$. A. $\frac{3}{37}$. L. lat. 55. Vert. 10/14.

The height of the body is a little more than its length (without fins); the diameter of the eye is contained twice and one-third in the length of the head. Uniform silvery.

Coasts of West Africa.

a. Fine specimen. River Niger. From Mr. Fraser's Collection.
b. Fine specimen. India (?).
c. Adult: skeleton. Gold Coast.
d. Adult: bad state. Coast of Africa. From the Haslar Collection.

e. Adult. Purchased of M. Parzudaki.
f. Adult: stuffed. Old Collection.

Skeleton.—The skull is slightly compressed and rather short; a very high, triangular occipital crest extends from the occipital joint to the anterior extremity of the frontal bones; there are two ridges on each side of this crest, the interior proceeding from the anterior angle of the orbit, the exterior from the superciliary margin. The maxillary becomes gradually broader posteriorly; the intermaxillary has the posterior processes of moderate length; the mandibula with a rudimentary muciferous channel. The præoperculum has the lower limb shorter than the posterior; both meet at a right angle, which, however, is rounded; its interior ridge is slightly raised above the level of the bone, and there is a rudimentary muciferous channel behind it. The operculum is twice as high as wide, with a notch superiorly and another posteriorly; the sub- and interoperculum are nearly of equal length. The infraorbital ring is very narrow, the præorbital somewhat wider. The suprascapula is suspended to the skull by two processes; the scapula is oblong; the humerus, with the ulna, forms a spacious cavity for the pectoral muscles; there is a wide free space between the two bones. The pubic bones are slender and narrow, similar to those in *Lichia*.

There are ten abdominal and fourteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·9. The abdominal vertebræ are very compressed in their longitudinal diameter, especially the anterior ones. The neural spines are strong, erect; those of the abdominal vertebræ are close together, and being dilated, they leave scarcely any interspace between them. There are three spurious interneural spines, each of which is provided superiorly with a point directed forwards. The interneurals are closely fixed together, and form, as it were, one uninterrupted solid plate. The hæmals are strong, and the anterior ones very elongate; the first is firmly joined to its interhæmal, both forming an exceedingly strong bone, which is longer than the whole vertebral column; its inferior part is dilated, and provided with two ridges, radiating from the base of the first anal spine. Although we have observed the same structure in all the preceding *Carangidæ*, I know no other instance in which those bones are developed to an equal extent. The second, third, fourth and fifth hæmal spines are dilated into transparent lamellæ closing the interspaces between the spines. The interhæmals are joined together like the interneurals.

2. Psettus argenteus.

Chætodon argenteus, *L. Amœn. Acad.* iv. p. 249: *Bl. Schn.* p. 230.
Scomber rhombeus, *Forsk.* p. 58.
Centrogaster rhombeus, *L. Gm.* p. 1353.
Acanthopus argenteus, *Lacép.* iv. pp. 558, 559.
Centropodus rhomboidalis, *Lacép.* iii. pp. 303–305
Russell, pl. 59.
Psettus rhombeus, *Cuv. & Val.* vii. p. 245; *Cuv. Règne Anim. Ill. Poiss.*

pl. 42. f. 2; *Bleek. Verh. Batav. Genootsch.* xxiii. *Chætod.* p. 29; *Peters, Wiegm. Arch.* 1855, p. 247.
Monodactylus rhombeus, *Cant. Catal.* p. 172.
Psettus argenteus, *Richards. Voy. Ereb. & Terr. Fishes,* p. 57. pl. 35. f. 1–3.

D. $\frac{8}{29}$. A. $\frac{3}{29}$. L. lat. 75. Vert. 9/14.

The height of the body is $1\frac{1}{2}$ in its length (without fins); the diameter of the eye is nearly one-third the length of the head. Silvery: a blackish ocular band, indistinct in mature specimens.

From the Red Sea, through all the Indian Seas, to the coasts of Australia and Polynesia.

a. Half-grown. Moluccas. Purchased of Mr. Frank.
b. Adult: skeleton. Amboyna. Purchased of Mr. Frank.
c, d. Skins. Malayan Peninsula. From Dr. Cantor's Collection.
e. Half-grown. Ceylon. Presented by Sir A. Smith.
f. Half-grown. Purchased of Mr. Frank.
g. Half-grown. Australia.
h. Adult: skin. Australia.
i. Adult. From the Museum of Economic Geology.
k. Half-grown. From the Collection of the Zoological Society.
l. Adult. From the Haslar Collection.

The *skeleton* is very similar to that of the preceding species, but less compressed and elevated; it differs chiefly in the following points: the interior of the lateral ridges on the upper surface of the skull is scarcely visible; the mandibula is very low. I do not find more than nine abdominal vertebræ, one of the anterior ones not being developed, apparently owing to the short longitudinal diameter of this portion; its length is to that of the caudal portion as 1 : 2·1. The posterior interneurals and interhæmals are feeble, and leave free spaces between them. The first hæmal and interhæmal are also united to a strong bone, but it is much shorter than the vertebral column; it is inferiorly dilated into a triangular plate with a slight ridge. The ribs are of moderate strength and length.

3. Psettus falciformis.

Monodactylus falciformis, *Lacép.* iii. pp. 131, 132, 133.
Psettus commersonii, *Cuv. & Val.* vii. p. 250.

D. $\frac{8}{29}$. A. $\frac{3}{29}$.

Scales very small. The height of the body is $1\frac{2}{3}$ in its length (without fins); the diameter of the eye is $2\frac{1}{3}$ in the length of the head. Silvery.

Red Sea; Sea of Vanicolo; Chinese Sea.

a. Adult: bad state. Red Sea. Purchased of Mr. Frank.
b. Adult: stuffed.
c. Adult: skin.
d. Adult: skin. Purchased of Mr. Warwick.

18. PLATAX*.

Plàtax, *Cuv. & Val.* vii. p. 213.

Body much compressed and elevated; snout very short. One dorsal, with the spinous portion nearly entirely hidden, and generally formed by five (3–7) spines; the anal with three; ventrals well developed, with one spine and five rays. Teeth setiform, with an external series of rather larger ones, notched at the top; no teeth on the palate. Scales of moderate size, or rather small. Six branchiostegals; air-bladder simple.

All the Indian Seas.

The fishes which compose this genus appear to be subject to considerable change in the form of the fins, and in colour, according to age; and therefore the following species can scarcely be considered as good ones: even Bleeker, who has collected these fishes in their native seas, acknowledges the difficulty of distinguishing them without examining a large number of specimens. Of the fourteen species established or adopted by Cuvier, at least one half are merely nominal ones,—a not uncommon occurrence in his great work. *Platax scalaris* belongs to the *Pharyngognathi*, as does likewise *Plataxoides*, Casteln.

1. Platax vespertilio.

Valent. no. 62; *Renard*, pl. 24. f. 129; *Seba*, iii. 25. 15
Chætodon vespertilio, *Bl.* tab. 199. f. 2; *L. Gm.* p. 1257; *Bl. Schn.* p. 228; *Shaw, Zool.* iv. p. 344; *Bennett, Ceylon Fishes*, pl. 5.
? Chætodon pinnatus, *L. Mus. Ad. Frid.* pl. 33. f. 6; *L. Gm.* p. 1241.
Platax vespertilio, *Cuv. Règne Anim.*; *Rüpp. Atl.* p. 143, and *N. W. Fische*, p. 33; *Cantor, Catal.* p. 166; *Peters in Wiegm. Arch.* 1855, p. 247.
—— gaimardi, *Cuv. & Val.* vii. p. 216.
—— guttulatus, *Cuv. & Val.* vii. p. 227. pl. 186 (young).
—— albipunctatus, *Rüpp. Atl. Fische*, p. 69. t. 18. f. 4 (young).
—— blochii, *Cuv. & Val.* vii. p. 222; *Bleeker, Verh. Bat. Gen.* xxiii. *Chætod.* p. 27.
—— ehrenbergii, *Cuv. & Val.* vii. p. 221; *Rüpp. N. W. Fische*, p. 33; *Richards. l. c.* p. 245; *Cuv. Règne Anim. Ill. Poiss.* pl. 42. f. 1.

D. $\frac{5}{35-37}$. A. $\frac{3}{26-28}$. L. lat. 64.

The height of the body is more than its length (without fins); snout entirely obtuse, not prominent. Dorsal and anal fins elevated; the ventrals extending nearly to the middle of the anal fin. Ventrals black; a brown ocular band, reticulated with black.

From the eastern coasts of Africa, through all the East Indian Seas.

a. Five inches long. From the Collection of the Zoological Society.

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* 1. Platax punctulatus, *Cuv. & Val.* vii. p. 228. pl. 186.—Timor.
2. —— gambret, *Bleeker, Verhand. Batav. Genootsch.* xxiii. *Chætod.* p. 29, and *Java*, i. p. 105.—Seas of Batavia and Madura.
Platax ocellatus, *Cuv. & Val.*, *Cant.*, is identical with Chætodon oligacanthus, *Bleek.* p. 34.

b. Four inches long. From the Haslar Collection.
c. Four inches long: skin.
d. Young. Amboyna. Purchased of Mr. Frank.
e. Half-grown. Singapore. From Dr. Cantor's Collection.
f. Young. Singapore.
g. Young. Sea of Pinang. From Dr. Cantor's Collection.
h–l. Adult, half-grown, and young: skins. From Dr. Cantor's Collection.
m. Young. Philippines. Purchased of Mr. Cuming.
n. Young. China. Presented by Captain Sir E. Belcher, C.B.
o–r. Half-grown and young: skins. Sea of Pinang. From Dr. Cantor's Collection (*Platax guttulatus*).

2. **Platax orbicularis.**

Chætodon orbicularis, *Forsk.* p. 59.
—— pentacanthus, *Lacép.* iv. p. 454. pl. 9. f. 2.
Platax orbicularis, *Cuv. & Val.* vii. p. 232; *Rüpp. Atl.* p. 67. t. 18. f. 3; *Bleeker, Sumatra,* iv. p. 81.
—— pentacanthus, *Cuv. & Val.* vii. p. 235.

D. $\frac{3-5}{36-37}$. A. $\frac{3}{26-27}$. L. lat. 55–60.

The height of the body is less than its length (without fins); the snout is prominent, the præorbital a little narrower than the orbit. The dorsal and anal fins moderately elevated, rounded: the ventrals do not reach to the anal; they are black at the base and at the extremity. A more or less distinct ocular band.

Red Sea; East Indian Archipelago; N.W. coast of Australia.

Probably founded on old specimens of *Platax vespertilio.*

a. Eighteen inches long: stuffed. Port Essington. From Mr. Gould's Collection.
b. Twelve inches long: stuffed.

3. **Platax boersii.**

Bleeker, Celebes, iii. p. 758.

D. $\frac{5}{34}$. A. $\frac{3}{27}$. L. lat. 45.

The height of the body is more than its length (without fins); the snout is not prominent, the præorbital more than twice as low as the orbit (above the angle of the mouth); the dorsal, anal, and ventrals are much produced, the latter reaching to the caudal fin. An ocular band; ventrals black, caudal yellow-edged. (*Bl.*)

Sea of Macassar.

4. **Platax raynaldi.**

Cuv. & Val. vii. p. 219.

D. $\frac{5}{32-33}$. A. $\frac{3}{23-24}$.

The height of the body is one-fifth less than the total length snout entirely obtuse, not prominent. Dorsal and anal fins elevated; the ventrals extending nearly to the middle of the anal fin. A blackish band through the eye and another over the shoulder; dorsal, anal, and ventral fins blackish. (*Cuv.*)

Coasts of Ceylon and Pondicherry.

5. Platax xanthopus.

Bleeker, Verhand. Batav. Genootsch. xxiii. *Chætod.* p. 28, and *Java*, i. p. 105.

D. $\frac{5}{33}$. A. $\frac{3}{24}$. L. lat. 60.

Body as high as long (without fins); snout scarcely prominent; ventral fins extending to the anal spines. Yellowish-grey; the vertical fins black-edged, the ventrals yellow. (*Bl.*)

Sea of Batavia.

6. Platax arthriticus.

? *Dampier, Voy. New Holland*, pl. 4, middle figure.
Chætodon arthriticus, *Bell, Phil. Trans.* 1793, p. 8. pl. 6 (old age).
Platax batavianus, *Cuv. & Val.* vii. p. 225; *Bleeker, Verhand. Batav. Genootsch.* xxiii. *Chætod.* p. 28 (young and middle age).
—— arthriticus, *Cuv. & Val.* vii. p. 229; *Cantor, Catal.* p. 169.
Skeleton of an old specimen: *Owen, Osteolog. Catal.* i. p. 64.

D. $\frac{7}{29-32}$. A. $\frac{3}{22-23}$. L. lat. 60. Vert. 11 13.

The height of the body is less than its length (without fins); the snout is prominent; the dorsal, anal, and ventral fins are much elongate in immature specimens, in adult ones rather obtuse, the ventrals extending to the anal spines; the ocular band disappears with age; ventrals black, the vertical fins edged with black.

Seas of Batavia, Amboyna, and Pinang.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Sixteen inches long: stuffed. Sea of Pinang. From Dr. Cantor's Collection.
c. Skeleton of a half-grown specimen.

There is a *skeleton* in the Collection of the British Museum, which, as I believe, belongs to this species. The upper surface of the skull, between the orbits, is rather flat, somewhat rugose; the crown is elevated in a very high and strong triangular crest; the lateral ridges are little developed, and take their origin from the median line of the skull. The basal portion of the brain-capsule is very compressed. The jaw-bones are short: the maxillary is slightly dilated posteriorly; the intermaxillary is stouter, with short posterior processes; the mandibula is very short, without muciferous channel. The posterior præopercular limb is twice as long as the inferior; both meet at a rather obtuse angle. The operculum is $2\frac{1}{2}$ as high as wide, with a very open notch posteriorly. The suboperculum is much longer than the interoperculum. The præorbital is quadrangular, the remainder of the infraorbital ring very narrow. The humeral arch does not show any peculiarity. The pubic bones are broad, each being composed of three lamellæ, the interior of which is the broadest.

There are eleven abdominal and thirteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the caudal as 1 : 1·17. The vertebræ are compressed in their longitudinal diameter. The neural and hæmal spines are stout. There are three spurious interneurals terminating superiorly in points directed forwards; they are in immediate contact with the occipital crest. The anterior interneurals are elevated and close together, the posterior shorter and feeble. The first interhæmal is joined to the first hæmal spine, of moderate strength, and inferiorly dilated. The ribs are well developed.

7. Platax teira.

Chætodon teira, *Forsk.* p. 60. tab. 22; *Bl.* tab. 199. f. 1; *L. Gm.* p. 1265; *Bl. Schn.* p. 221· *Shaw, Zool.* iv. p. 345. pl. 48.
Russell, pl. 87.
Platax teira, *Cuv. Règne Anim.*; *Rüpp. Atl. Fische*, p. 68, and *N. W. Fische*, pp. 33, 37; *Cuv. & Val.* vii. p. 226; *Cantor, Catal.* p. 168; *Bleek. Verh. Bat. Gen.* xxiii. *Chætod.* p. 28; *Peters, Wiegm. Arch* 1855, p. 247.
—— leschenaldi, *Cuv. & Val.* vii. p. 223.
—— vespertilio, *Temm. & Schleg. Faun. Japon. Poiss.* p. 83. pl. 43.

$$D. \frac{5}{31-33}. \quad A. \frac{3}{24-27}.$$

Scales very small. The height of the body is more than its length* (without fins); snout entirely obtuse, not prominent. Dorsal and anal fins exceedingly elevated in immature specimens, obtuse in adult ones; the ventral fins reach beyond the caudal, in adult specimens scarcely to the anal. Ventrals black; in immature age with three blackish vertical bands, one through the eye, the other over the shoulder to the belly, the third from the dorsal to the anal; the bands disappear with age.

East Indian and Chinese Seas.

a. Half-grown. Moluccas. Purchased of Mr. Frank.
b–e. Young. Borneo.
f. Half-grown. Ceram. Purchased of Mr. Frank.
g. Half-grown. China. .
h. Young. China. Presented by Captain Sir E. Belcher, C.B.
i. Half-grown: stuffed. Bribe's Point.
k. Half-grown.
l–o. Half-grown and young: skins. Sea of Pinang. From Dr. Cantor's Collection.

19. ZANCLUS.

Zanclus, (*Commers.*) *Cuv. & Val.* vii. p. 102.

Body much compressed and elevated. One dorsal with seven spines, the third of which is very elongate. No teeth on the palate;

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* Bleeker states both dimensions to be equal.

præoperculum without spine. Scales minute, rough. Air-bladder present; branchiostegals four. Pyloric appendages in increased number.

Indian Ocean and Archipelago; Polynesia.

1. Zanclus cornutus.

Renard, i. 13. 76, ii. 9. 44, ii. 16. 75; *Ruysch*, tab. 1. f. 3; *Valent.* iii. f. 168. 456; *Seba*, iii 25. 6.
Chætodon, *Artedi*, *Synon.* p. 79.
Tetragonopterus, sp., *Klein*, *Miss.* iv. tab. 12. f. 2 & 3.
Chætodon cornutus, *L. Syst.* p. 461; *Bl.* taf. 200. f. 2; *Bl. Schn.* p. 221; *Lacép.* iv. p. 473. pl. 2. f. 1.
Zanclus cornutus, *Cuv. & Val.* vii. p. 102. pl. 177; *Bleeker*, *Verhand. Batav. Genootsch.* xxiii. *Chætod.* p. 22.
Gonopterus mœrens, *Gronov. Syst. ed. Gray*, p. 77.
Skeleton: *Rosenthal*, *Ichthyot. Tafeln*, tab. 13. f. 3; *Agass. Recherch. Poiss. Foss.* iv. tab. G.

B. 4. D. $\frac{7}{41}$. A. $\frac{3}{32}$. Cæc. pylor. 14. Vert. 9/13.

A pointed horn above each orbit (in adult specimens). The third dorsal spine exceedingly elongate, filiform. Two broad black cross-bands from the dorsal fin to the belly; caudal black, with the posterior margin white, crescent-shaped.

Indian Ocean and Archipelago; Polynesia.

a. Very fine specimen. Amboyna. From Mr. Frank's Collection.
b. Half-grown. Amboyna. From Mr. Frank's Collection.
c. Half-grown. Ceram. From Madame Ida Pfeiffer's Collection.
d. Half-grown: stuffed. Sandwich Islands.
e. Adult: not good state.
f. Adult: not good state.
g. Adult.
h. Adult. From the Haslar Collection.
i, *k*. Half-grown: bad state. From the Haslar Collection.
l. Half-grown. From the Haslar Collection.
m. Adult. Old Collection.
n. Adult: discoloured. Old Collection.
o. Half-grown: skin. From Gronow's Collection.
p. Adult: skeleton. From the Collection of the Zoological Society.

The *skeleton* has been described and figured by several authors; the anterior and posterior portions of its vertebral column are so shortened in their longitudinal diameter, that, at both extremities, one vertebra has not been developed.

2. Zanclus canescens.

Seba, iii. 25. 7.
Chætodon canescens, *Artedi*, *Spec.* p. 93; *L. Syst. Nat.* i. p. 460; *Bl. Schn.* p. 219.
Zanclus centrognathus, *Cuv. & Val.* vii. p. 528.

D. $\frac{7}{39}$. A. $\frac{3}{31}$.

No horn on the forehead; præorbital with a strong spine above the angle of the mouth. The third dorsal spine exceedingly elongate, filiform. Silvery; back and posterior part of the body and a vertical band through the eye greyish.

Sea of Vanicolo; also found in the stomach of a *Coryphæna* caught in 1° N. L., 75° E. Long., Paris Merid.

20. PSENES*

Psenes, *Cuv. & Val.* ix. p. 259.

Body compressed, elevated, covered with rather small cycloid scales; cleft of the mouth narrow, with the muzzle above swollen, truncated and short. Two dorsals: the first continuous; the second and the anal are much more developed, without finlets; three (two) anal spines, joined to the soft portion. A series of small teeth in the jaws, none on the palate. Six (seven) branchiostegals; air-bladder bifurcate posteriorly.

East Indian and Australian Seas.

1. Psenes cyanophrys.

Cuv. & Val. ix. p. 260. pl. 265.

B. 6. D. $9 \mid \frac{1}{25}$. A. $\frac{3}{25}$.

The height of the body is $2\frac{1}{2}$ in the total length, the length of the head four times. Snout truncated, short, equal in length to the diameter of the eye which is one-fourth of the length of the head. The lower jaw extends slightly beyond the upper. The soft dorsal and anal covered with small scales. Reddish-brown, with a blue streak on the side of the head, above the eye, anteriorly convergent with that of the other side. (*Cuv.*)

Coast of New Ireland.

2. Psenes javanicus.

Cuv. & Val. ix. p. 264; *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 74, and *Act. Soc. Indo-Nederl.* ii. *Amboina*, p. 61.

B. 6. D. $9\text{–}10 \mid \frac{1}{24\text{–}25}$. A. $\frac{3}{25\text{–}26}$. L. lat. 55.

The height of the body is $2\frac{2}{3}$ to 3 times in the total length, the length of the head $4\text{–}4\frac{1}{3}$. Snout truncated, and much shorter than the diameter of the eye, which is $2\frac{2}{3}$ to 3 times in the length of the head. The maxillary reaches to below the anterior half of the eye. Angle of the præoperculum very slightly denticulated. Greenish above; back and sides with numerous brown longitudinal streaks; dorsal, anal, and ventral fins brown.

Seas of Java and Amboyna.

a, b. Amboyna. Purchased of Mr. Frank.

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* 1. Psenes auratus, *Cuv. & Val.* ix. p. 264.—Gulf of Bengal.

3. Psenes leucurus.

? *Cuv. & Val.* ix. p. 265; *Jenyns, Zool. Beagle, Fishes,* p. 73.

D. 10 | $\frac{1}{27}$. A. $\frac{3}{27}$.

The height of the body is $2\frac{1}{2}$ in the total length. Fins black or dusky; caudal whitish.

Indian Ocean; Port Jackson; Pacific, in Lat. 17° 12′ S., Long. 36° 33′ W.

a–c. One inch to $1\frac{1}{2}$ inch long.
d. One inch long. Presented by the College of Surgeons.
e. Two inches long. (Gulf of Guinea?)
f. One inch and a half long. Presented by J. B. Godfrey, Esq.
g, h. One inch long. Presented by J. B. Godfrey, Esq.

4. Psenes guamensis.

Cuv. & Val. ix. p. 266.

D. 9 | $\frac{1}{22}$. A. $\frac{2}{29}$.

The height of the body is $2\frac{1}{4}$ in the total length. Reddish, with darker longitudinal streaks. (*Cuv.*)

Sea of Guam.

5. Psenes anomalus.

Trachinotus anomalus, *Temm. & Schleg. Faun. Japon. Poiss.* p. 107. pl. 57. f. 2.

Psenes anomalus, *Bleeker, Japan,* p. 409, and *Verh. Bat. Gen.* xxvi. *Japan,* p. 104.

B. 7. D. 6 | 29. A. 3 | 26. L. lat. 55.

The height of the body is three times in the total length, the length of the head $4–4\frac{1}{3}$. The snout is truncated, and much shorter than the diameter of the eye, which is one-third the length of the head. The spinous dorsal is very low. Coloration uniform; a large violaceous spot on the shoulder.

Sea of Japan.

21. CAPROS.

Capros, *Lacép.* iv. p. 590; *Cuv. Règne Anim.*; *Cuv. & Val.* x. p. 29.

Body compressed and elevated; mouth very protractile. Scales rather small, spiny. Two contiguous dorsals, the first with nine spines, the anal with three. No bony plates along the base of the dorsal and anal fins. Ventral fins composed of one spine and five rays. Minute teeth in the jaws and on the vomer, none on the palatine bones. Branchiostegals five; air-bladder large. Pyloric appendages in small number.

Mediterranean; south coast of England.

1. Capros aper.

The Boar-fish.

Aper, *Rondel.* v. cap. 27. p. 161; *Aldrov.* iii. cap. 12. p. 297; *Jonston,* i. tit. i. cap. i. art. 4; *Willughby,* p. 296. tab. J. 4. f. 4; *Ray,* p. 99.

Zeus, sp. 3, *Artedi, Genera*, p. 50.
—— aper, *L. Syst.* i. p. 455; *Bl. Schn.* p. 96.
Perca pusilla, *Brünn. Ichth. Mass.* p. 62; *Bl. Schn.* p. 88; *Shaw, Zool.* iv. p. 550.
—— brunnich, *Lacép.* iv. pp. 412, 413.
Capros aper, *Lacép.* iv. p. 591; *Risso, Eur. Mérid.* iv. p. 380; *Proc. Zool. Soc.* 1833, p. 114; *Yarrell, Brit. Fishes*, i. p. 190; *Cuv. & Val.* x. p. 30. pl. 281; *Guichen. Explor. Algér. Poiss.* p. 65; *Cuv. Règne Anim. Ill. Poiss.* pl. 60. f. 2; *Lowe, Trans. Zool. Soc.* ii. p. 183; *Andrews, in Natur. Hist. Review*, 1858, p. 188.
Zeus childrenii, *Bowd. Excurs. Madeira*, p. 124.

D. 9 | 23–24. A. 3 | 23. V. 1/5. Cæc. pylor. 2. Vert. 10/12–13.

The upper and lower profiles of the snout concave. Scales small; spines of the dorsal and ventral fins strong. Uniform brownish-red.

Mediterranean; occasionally taken on the south coast of England and Ireland (Ventry Harbour; Dingle Bay).

a. Half-grown. Mediterranean. Purchased of Mr. Frank.
b. Adult. Dalmatia.
c. Adult. Madeira. From the Haslar Collection.
d. Adult. Brighton. Presented by J. R. Reeves, Esq.
e. Adult: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
f. Adult: stuffed. Weymouth Bay.
g–k. Adult: dried. From Mr. Yarrell's Collection.
l. Adult: dried.
m, n. Half-grown. From the Haslar Collection.
o. Adult: skeleton. Madeira. From the Haslar Collection.

Skeleton.—The bones of the skull have the outer surface very rough, finely striated, and porous. There is a very strong, elevated triangular crest on the crown of the head. Immediately before this crest, and between the frontal bones, is a wide cleft to receive the processes of the intermaxillaries, which are exceedingly long, and penetrate into the interior of the cavity of the skull. The supraoccipital is very thin on the sides of the crest, and, this part being easily broken, the skull appears to be provided with two foramina. There is another round cavity on each side of the posterior part of the skull. The turbinal bones appear to be united, forming a kind of roof, below which the processes of the intermaxillaries move The maxillary is narrow, not dilated at the extremity; the intermaxillary has the lateral portion little developed, but the posterior processes exceedingly long. The mandibula is rather long, slightly curved, and is highest in its middle; there is no free space between the dentary and articulary bones. The infraorbital ring is composed of three pieces: the præorbital, which is quadrangular; a middle piece, of a more oblong form; and a posterior one, which is narrow, curved, and joined to the præoperculum, without extending to the upper posterior angle of the orbit. The præoperculum has the lower limb rather shorter than the posterior; both meet at an obtuse angle. The operculum is very small and narrow; the interoperculum is exceedingly narrow and styliform; the suboperculum firmly attached to the opercle. The suprascapula is anchylosed to the bones of the skull; the upper and lower portions of the humerus are dilated, and there is a very narrow cleft between the radius and humerus; the former does not extend so far downwards as the humerus. The coracoid is much stronger than the ribs, and composed of two bones. The pubic bones are well developed, and do not leave a free space between them; each is composed of three lamellæ, the inferior of which is the broadest, having the edge swollen.

There are ten abdominal and twelve or thirteen caudal *vertebræ*, the length of the former portion of the vertebral column being to that of the latter as 1 : 1·33. All the vertebræ are very short, with the neural and hæmal spines of moderate strength; the hæmal of the first caudal vertebra, however, is much stronger than the others. The interneurals of the spinous dorsal fin are dilated and provided with prominent ridges, whilst those of the soft dorsal are very feeble; the first interneural bears two dorsal spines, and has a pointed process anteriorly, which extends on to the occipital crest. The interhæmal of the anal spines is straight, and dilated at its extremity; it is firmly attached to the first hæmal, which also supports the interhæmals of the first three anal rays. The arrangement of the other interhæmals is the same as in *Micropteryx chrysurus*.

22. ANTIGONIA.

Antigonia, *Lowe, Proc. Zool. Soc.* 1843, p. 85.
Caprophonus, *Müll. & Trosch. Horæ Ichthyol.* iii. p. 28.

Body very compressed and elevated, covered with rather small spiny scales; mouth little protractile. Dorsal fin continuous, with eight spines; three anal spines, remote from the soft portion. Ventral fins composed of one spine and five rays. Very small teeth in the jaws. Branchiostegals five (seven).

Seas of Barbadoes and Madeira.

1. Antigonia capros.

Antigonia capros, *Lowe, l. c.* (jun.).
Caprophonus aurora, *Müll. & Trosch. l. c.* taf. 5. f. 1 (adult).

B. 5 (*Müll. & Trosch.*), 7 (*Lowe*). D. $\frac{8}{34}$. A. 3 | 32–33. V. 1/5.

The height of the body is five-sixths of the total length. The ventral spine very strong, and striated. Red.

Seas of Madeira and Barbadoes.

23. EQUULA*.

Equula, *Cuv. Règne Anim.*; *Cuv. & Val.* x. p. 60.

Body more or less compressed, elevated or oblong, covered with small, deciduous, cycloid scales. Mouth very protractile. Minute teeth in the jaws; none on the palate. One dorsal: formula of the fins—D. $\frac{8}{15–16}$. A. $\frac{3}{14}$. V. 1/5. The lower præopercular margin serrated. Branchiostegals five (four); pseudobranchiæ present; air-bladder large, terminating posteriorly in two short horns. Pyloric appendages in small number.

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* 1. Bindoo-karah, *Russell*, i. pl. 64.—Equula bindus, *Cuv. & Val.* x. p. 78; *Cantor, Catal.* p. 148.—East Indian Seas.

a. Half-grown: skin: bad state. Sea of Pinang. From Dr Cantor's Collection. [2.

East Indian Ocean and Archipelago.

1. Equula fasciata.

Karah, *Russell*, i. p. 51. pl. 66.
Clupea fasciata, *Lacép.* v. p. 463.
Equula filigera, longispinis, carah, et fasciata, *Cuv. & Val.* x. pp. 92–97. pl. 284.
—— filigera, *Cuv. Mém. Mus.* i. p. 402. pl. 23. f. 1; *Cantor, Catal.* p. 150; *Bleeker, Timor*, i. p. 165, and *Verh. Bat. Gen.* xxiv. *Makr.* p. 79.
—— setigera, *Agass. Recherch. Poiss. Foss.* v. p. 24. tab. L. (skeleton, from America!).

D. $\frac{8}{16}$. A. $\frac{3}{14}$. Cæc. pylor. 3. Vert. 10/13.

The height of the body is $2\frac{1}{3}$ in the total length, the length of the head four times. A pair of small spines above the anterior margin of the orbit; the cavity on the head is subquadrangular, and $2\frac{1}{4}$ times as long as broad. The lower præopercular margin is very indistinctly serrated, and its length is $1\frac{1}{4}$ in that of the mandibula; the mandibula is concave, and ascends at an angle of about 40°. The second spine of the dorsal fin, and sometimes of the anal, is very elongate, often as high as the body. Scales very small. Body with irregular vertical blackish streaks.

Red Sea; Indian Ocean and Archipelago.

a. Adult. Red Sea.
b. Adult: skin. Malayan Peninsula. From Dr. Cantor's Collection.
c. Adult. Philippine Islands.

2. Equula edentula.

Scomber flavescens, &c., *Seba*, iii. p. 75. tab. 27. f. 4.
—— edentulus, *Bloch*, taf. 428 (bad); *Bl. Schn.* p. 36.
Leiognathus argenteus, *Lacép.* iv. pp. 448, 449.
Komah-karah, *Russell*, i. p. 50. pl. 63.
Equula ensifera, *Cuv. & Val.* x. p. 66; *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 80.
—— coma, *Cuv. & Val.* x. p. 76.
? Equula serrulifera, *Richards. Voy. Ereb. & Terr. Ichthyol.* p. 137. pl. 59. f. 12–14 (fig. restored).

B. 5. D. $\frac{8}{15–16}$. A. $\frac{3}{14}$ Cæc. pylor. 2.

The height of the body is $2–2\frac{1}{4}$ in the total length, the length of

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2. Equula brevirostris, *Cuv. & Val.* x. p. 83.—Coast of Malabar.
3. —— blochii, *Cuv. & Val.* x. p. 84.—Coast of Malabar.
4. —— gracilis, *Bleeker, Celebes*, v. p. 249.—Sea of Manado.

the head 4–$4\frac{1}{3}$; the upper profile is angular. A pair of small spines above the anterior margin of the orbit; the cavity on the head is subquadrangular, much broader anteriorly than posteriorly, its width between the spines being $1\frac{2}{3}$ in its length. The lower præopercular margin is serrated, and its length is $1\frac{2}{5}$ in that of the mandibula. The mandibula is very concave, and ascends at an angle of about 45°. The length of the second dorsal spine is three-quarters of that of the head. Scales very small, but conspicuous. The spinous dorsal without black; base of the pectoral brownish.

Red Sea; East Indian (and Australian) Seas.

a. Adult. Red Sea.
b. Half-grown. Bengal. From the Collection of the East India Company.
c. Half-grown: bad state. Madras. Presented by T. C. Jerdon, Esq.
d. Adult: bad state. Calcutta. From the Collection of Messrs. von Schlagintweit.
e. Fine specimen. Amboyna. Purchased of Mr. Frank.
f. Half-grown. India. Presented by G. R. Waterhouse, Esq.
g–*i*.? Half-grown: half-destroyed. Australia. Presented by Sir J. Richardson.—Types of *Equula serrulifera*.
k. Adult.
l, *m*. Half-grown: bad state. From the Haslar Collection.
n. Large specimen: skin. From Gronow's Collection.

3. Equula caballa.

Scomber equula, *Forsk.* p. 58; *Bl. Schn.* p. 36; *Shaw, Zool.* iv. p. 596.
Centrogaster equula, *L. Gm.* p. 1337.
Cæsio equulus, *Lacép.* iii. pp. 85, 90.
Russell, pl. 62.
Equula caballa, *Cuv. & Val.* x. p. 73; *Rüppell, N. W. Fische*, p. 51; *Cantor, Catal.* p. 146.

B. 5. D. $\frac{8}{16}$. A. $\frac{3}{14}$.

The height of the body is twice in the total length, the length of the head $3\frac{2}{3}$. A pair of small spines above the anterior margin of the orbit. The lower præopercular margin is finely serrated; the mandibula very concave. The length of the second dorsal spine equals that of the head. Scales very conspicuous. The spinous dorsal without black; axil blackish.

Red Sea; East Indian Seas.

I should not hesitate to consider this species as identical with *E. edentula* or *E. dussumieri*, if it were not for the greater length of the head, expressly stated by Valenciennes. Still more doubtful is the species described by Cantor as *Equula caballa*; he says, that the length of the head is contained $3\frac{2}{3}$ in the total, but he takes the latter from the snout only to the centre of the caudal margin. The other character, taken by Dr. Cantor from the relative length of the anal spines, is not of much value. The following specimen, from Dr. Cantor's Collection, does not admit of a minute examination:—

a. Adult: skin: not good state. Malayan Peninsula. From Dr. Cantor's Collection.

4. Equula dussumieri.

Cuv. & Val. x. p. 77. pl. 283; *Cuv. Règne Anim. Ill. Poiss.* pl. 62. f. 1 (bad).

D. $\frac{8}{16}$. A. $\frac{3}{14}$.

The height of the body is $2\frac{1}{2}$ in the total length, the length of the head four times. A pair of small spines above the anterior margin of the orbit; the cavity on the head is triangular, and not quite twice so long as broad. The lower præopercular margin is minutely serrated, and its length is $1\frac{1}{4}$ in that of the mandibula. The mandibula is very slightly concave, and ascends at an angle of about 40°. The length of the second dorsal spine is two-thirds of that of the head. Scales small, but very conspicuous. The spinous dorsal without black; base of the pectoral black.

East Indian Seas.

a. Fine specimen. From the Collection of the Zoological Society.
b. Half-grown: bad state. Borneo. Presented by Capt. Sir E. Belcher, C.B.

5. Equula gerreoides.

Bleeker, Makreel. p. 371, and *Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 81.

B. 5. D. $\frac{8}{16}$. A. $\frac{3}{14}$.

The height of the body is $2\frac{1}{2}$–3 times in the total length, the length of the head four times. The upper profile is rounded, that of the mandibula very concave. The lower præopercular margin denticulated. Scales very small, but conspicuous. The height of the second dorsal spine is $2\frac{1}{2}$–3 times in that of the body. The spinous dorsal without black; back with irregular dark spots. (*Bl.*)

Sea of Batavia.

6. Equula nuchalis.

Schleg. Faun. Japon. Poiss. p. 126. pl. 67. f. 1.

D. $\frac{8}{16}$. A. $\frac{3}{14}$.

The height of the body is $2\frac{2}{3}$ in the total length, the length of the head four times. A pair of very small spines above the anterior margin of the orbit; the cavity on the head is triangular, and twice as long as broad. The lower præopercular margin is finely serrated, and its length is $1\frac{1}{5}$ in that of the mandibula; the mandibula is slightly concave, and ascends at an angle of about 45°. The length of the second dorsal spine is two-thirds of that of the head. Scales exceedingly small. A black blotch on the spinous dorsal, and a blackish transverse spot on the nape of the neck.

Seas of China and Japan.

a, b. Adult. China.
c. Half-grown. China.
d. Half-grown: very bad state. China. Presented by J. R. Reeves, Esq.
e. Half-grown. China.
f. Young. China.
g. Young. Amoy (China). Purchased.

7. Equula bindoides.

Bleeker, Makreel. p. 372, and *Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 83.

B. 4. D. $\frac{8}{16}$. A. $\frac{3}{14-15}$.

The height of the body is $2\frac{1}{3}$–$2\frac{1}{2}$ in the total length, the length of the head $4\frac{1}{2}$. A pair of spines above the anterior margin of the orbit; the lower præopercular limb serrated. The inferior profile is more convex than the superior. Scales very small, but conspicuous; the lateral line terminates on the tail. The height of the second dorsal spine is one-third of that of the body. The spinous dorsal with an orange-coloured, brown-edged spot at the top; back with irregular dark spots.

East Indian Archipelago.

a, b. Adult: bad state. Borneo. Purchased of Mr. Frank.
c. Half-grown: bad state. Moluccas. Purchased of Mr. Frank.
d. Young. Singapore.

8. Equula splendens.

Goomorah karah, *Russell*, i. p. 48. pl. 61.
Equula splendens, *Cuv. Règne Anim.*; *Cantor, Catal.* p. 149.
—— gomorah, *Cuv. & Val.* x. p. 80; *Rüppell, N. W. Fische*, p. 51; *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 82.
—— caballa, *Bleek. Oost-Java* (not *Cuv. & Val.*).

D. $\frac{8}{15}$. A. $\frac{3}{14}$. Vert. 10 14.

The height of the body is $2\frac{1}{4}$–$2\frac{2}{3}$ in the total length, the length of the head four times. The upper profile is much more convex than the lower. A pair of small spines above the anterior margin of the orbit; the cavity on the head is about twice as long as broad. The lower præopercular margin is finely serrated, and its length is $1\frac{1}{4}$ in that of the mandibula; the mandibula is slightly concave, and ascends at an angle of about 35°. The length of the second dorsal spine is three-quarters of that of the head. Scales small. A black blotch on the spinous dorsal.

Red Sea; East Indian Seas.

a. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.

b. Adult. Amboyna. Purchased of Mr. Frank.
c. Half-grown. Amboyna. Purchased of Mr. Frank.
d. Half-grown. Amboyna. Purchased of Mr. Frank.
e. Half-grown. China Seas. Presented by Capt. Sir E. Belcher, C.B
f. Half-grown. China Seas. Presented by Capt. Sir E. Belcher, C.B.

9. Equula daura.

Dacer karah, *Russell*, i. p. 51. pl. 65.
Equula daura, *Cuv. Règne Anim.*; *Cantor*, *Catal.* p. 150.
—— dacer, *Cuv. & Val.* x. p. 83; *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 81.
—— brevirostris, *Bleek. Batav.* and *Oost-Java* (not *Cuv. & Val.*)

B. 5. D. $\frac{8}{15}$. A. $\frac{3}{14}$.

The height of the body is $2\frac{1}{2}$–3 times in the total length, the length of the head $4\frac{1}{2}$. The upper profile is scarcely more concave than the lower. Spines above the orbit very inconspicuous; the lower præopercular margin denticulated. The mandibula is very slightly concave. The length of the second dorsal spine is one-half of the height of the body. Scales very small, but conspicuous. A black blotch on the spinous dorsal.

East Indian Seas.

a. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.

10. Equula oblonga.

Scomber equula, var., *Forsk.* p. 58.
Equula oblonga, *Cuv. & Val.* x. p. 85; *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 84.
—— berbis, *Cuv. & Val.* x. p. 85.

B. 5. D. $\frac{8}{15-16}$. A. $\frac{3}{14}$.

The height of the body is $3\frac{2}{3}$–4 in the total length, the length of the head $4\frac{1}{3}$–$4\frac{1}{2}$. A pair of spines above the anterior margin of the orbit. The mandibula is very slightly concave; the lower præopercular margin serrated. Scales inconspicuous. The second dorsal spine is shorter than one-half the height of the body. Dorsal fin without black; back with irregular dark spots.

Red Sea; Seas of Java and Timor.

11. Equula lineolata.

? Equula lineolata, *Cuv. & Val.* x. p. 86.
Equula lineolata, *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 83.

B. 5. D. $\frac{8}{16}$. A. $\frac{3}{14}$.

The height of the body is 3–$3\frac{1}{5}$ in the total length, the length of the head $4\frac{1}{3}$–$4\frac{1}{2}$. A pair of spines above the anterior margin of the orbit. The mandibula is very slightly concave; the lower præopercular margin serrated. Scales inconspicuous. The second dorsal spine is equal to, or shorter than, one-half the height of the body. The spinous dorsal without black; back with irregular dark spots.

East Indian Seas.

a. Adult: bad state. Madras. Presented by T. C. Jerdon, Esq.
b. Half-grown: bad state. Madras. Presented by T. C. Jerdon, Esq.
c. Half-grown.

12. **Equula leuciscus.**

D. $\frac{8}{16}$. A. $\frac{3}{14}$.

The height of the body is three times in the total length, the length of the head $4\frac{1}{5}$. No spines above the orbit. The mandibula is straight, the lower præopercular margin very indistinctly serrated. Scales small and deciduous. The second dorsal spine is filiform, higher than the body. The spinous dorsal without black; back indistinctly dotted with brown.

Sea of Amboyna

a. Fine specimen. Amboyna. Purchased of Mr. Frank

Description of the specimen.—The body is rather oblong, its greatest depth being one-third of the total length; the upper profile is somewhat more convex than the lower. The length of the head is $4\frac{1}{5}$ in the total; the snout is somewhat produced, obtusely conical, and equal in length to the diameter of the eye, which is one-third of the length of the head. The upper and lower profiles of the snout are straight, the latter being more oblique. There are no spines above the eye. The width of the interorbital space equals the length of the eye. The groove between the orbits is broadest anteriorly, and becomes narrower posteriorly; it is $1\frac{1}{2}$ as long as wide. The angle of the præoperculum is somewhat obtuse, the lower limb having an oblique direction.

The dorsal fin begins immediately behind the vertical from the base of the ventrals; the second spine is very long, filiform, and extends beyond the middle of the soft portion; the third spine also is elongate, but only one-half the length of the preceding. The caudal is forked, and its length is one-fifth of the total. The anal commences vertically below the eighth dorsal spine; its second spine is flexible, and less than one-half the length of the second of the dorsal. The pectoral is short, obtusely pointed; its length is one-eighth of the total. The ventral is inserted behind the pectoral, and is composed of a rather stout spine and five rays; its length is contained ten times and a half in the total.

The scales are small, cycloid, and deciduous. The lateral line is slightly curved, and continued to the caudal fin.

Silvery: back dotted with brownish; the upper jaw is brown; the axil of the pectoral minutely dotted with black.

	inches.	lines.
Total length	5	3
Height of the body	1	9
Length of the head	1	1

	inches.	lines.
Diameter of the eye	0	$4\frac{1}{3}$
Length of the caudal	1	0
——— of the pectoral	0	8
——— of the ventral	0	6

13. Equula rivulata.

Schleg. Faun. Japon. Poiss. p. 126. pl. 67. f. 2; ? *Richards. Ichthyol. China*, p. 276.

$$D\ \frac{8}{16}.\quad A.\ \frac{3}{14}.$$

The height of the body is contained three times in the total length, the length of the head four times and one-fifth. The dorsal fin is low, and the length of the second spine is $3\frac{1}{2}$ in the height of the body. Back with numerous blackish streaks, descending obliquely backwards; dorsal fin without black. (*Schleg.*)

Sea of Japan.

14. Equula insidiatrix.

Zeus insidiator, *Bl.* tab. 192. f. 2, 3; *L. Gm.* p. 1221; *Bl. Schn.* p. 95; *Shaw, Zool.* iv. p. 284. pl. 41; *Lacép.* iv. pp. 572, 574.

Equula insidiatrix, *Cuv. & Val.* x. p. 98; *Cant. Catal.* p. 151; *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 84.

$$D.\ \frac{8}{16}.\quad A.\ \frac{3}{14}.$$

The height of the body is $2\frac{1}{4}$ in the total length, the length of the head $4\frac{2}{3}$. No spines above the orbit. The cavity on the head is triangular, and $2\frac{1}{2}$ as long as broad. The lower præopercular margin is minutely serrated; the mandibula ascends in a vertical line. The lateral line extends nearly to the tail. Scales exceedingly small. Back with rather irregular vertical blackish streaks, generally interrupted and forming spots.

East Indian Seas, entering fresh waters.

a–d. Adult. Sumatra. Purchased of Mr. Frank.

e, f. Adult: skins: bad state. Malayan Peninsula. From Dr. Cantor's Collection.

g. Young. China.

h. Adult.

i. Half-grown: bad state. From the Haslar Collection.

15. Equula interrupta.

Chanda ruconius, *Buch. Ham. Gang. Fishes*, pp. 106, 371. pl. 12. f. 35 (mouth faulty).

Equula interrupta, *Cuv. & Val.* x. p. 102; *Bleek. Verh. Bat. Gen.* xxiv. *Makr.* p. 85.

—— ruconius, *Cuv. & Val.* x. p. 79.

$$D.\ \frac{8}{16}.\quad A.\ \frac{3}{14}.$$

The height of the body is one-half the total length, the length of the head is contained $4\frac{2}{3}$ times in it. No spines above the orbit; the cavity on the head is triangular, and $2\frac{1}{2}$ as long as broad. The lower præopercular margin is minutely serrated; the mandibula ascends in a vertical line. Scales rather small; the lateral line terminates below the origin of the soft dorsal. Back with somewhat irregular vertical blackish streaks, generally interrupted and forming spots.

East Indian Seas; N.W. coast of Australia.

a. Adult: injured. Amboyna. Purchased of Mr. Frank.
b. Half-grown. Singapore.
c. Adult. China. Presented by J. R. Reeves, Esq.
d. Half-grown. China. Presented by Capt. Sir E. Belcher, C.B.
e. Half-grown. China. Presented by Capt. Sir E. Belcher, C.B.
f. Half-grown: bad state. Port Essington. From the Haslar Collection.
g. Half-grown: bad state. From the Haslar Collection.

16. **Equula parviceps.**

Cuv. & Val. x. p. 87.

D. $\frac{8}{15}$. A. $\frac{3}{14}$.

The height of the body is one-third of the total length, the length of the head one-fifth. The mandibula is straight, not concave; spines above the orbit inconspicuous. The height of the second dorsal spine is one-third of that of the body. Coloration uniform. (*Val.*)

Sea of Ile de France.

The following species deviates in several respects from the others of this genus:—

17. **Equula longimanus.**

Cantor, Catal. Mal. Fishes, p. 152.

B. 5. D. $\frac{10}{15}$. A. $\frac{4}{13}$.

The height of the body is one-third of the total length, measured to the centre of the posterior margin of the caudal; the length of the head is $3\frac{1}{3}$ in that distance. No spines above the anterior part of the orbit; præopercular margins smooth. Scales large, diaphanous, deciduous, so that the body appears to be naked. The second dorsal spine is one-third of the third, the length of which slightly exceeds one-half of the height of the body. The second anal spine is three-quarters of the second spine of the dorsal, but much broader, sabre-like. The pectorals are very elongated and falcated, extending as far back as the posterior third of the dorsal fin. A large, rounded, bluish-black spot on the anterior part of the side.

Sea of Malayan Peninsula and Islands.

a. Skin. From Dr. Cantor's Collection.—Type of the species.

24. GAZZA.

Equula, sp., *Cuv. & Val.* x. p. 88.
Gazza, *Rüpp. N. W. Fische*, p. 4.

Body more or less compressed, elevated or oblong, covered with very small cycloid scales. Mouth very protractile. Teeth in the jaws of moderate size, and a pair of canines in the upper; none on the palate. One dorsal: formula of the fins—D. $\frac{8}{15-16}$. A. $\frac{3}{14}$. V. 1/5. The lower præopercular margin serrated. Branchiostegals five; pseudobranchiæ present.

East Indian Seas; Polynesia.

1. Gazza minuta.

Scomber minutus, *Bl.* tab. 429. f. 2; *Bl. Schn.* p. 36.
Equula minuta, *Cuv. & Val.* x. p. 88.
—— dentex, *Cuv. & Val.* x. p. 91; *Peters, Wiegm. Arch.* 1855, p. 247.
Gazza minuta, *Bleek. Sumatra*, ii. p. 259, and *Verh. Bat. Gen.* xxiv. *Makr.* p. 85.

B. 5. D. $\frac{8}{16}$. A. $\frac{3}{14}$.

The height of the body is $2\frac{1}{3}$–$2\frac{1}{5}$ in the total length, the length of the head $3\frac{3}{4}$–$4\frac{1}{3}$. Canine teeth of moderate size. The height of the second dorsal spine is contained $2\frac{2}{3}$ times in that of the body; it nearly equals in length the second anal spine, which is, however, much stronger. Axil black; the spinous dorsal brownish anteriorly.

East Indian Seas.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Half-grown: not good state. Moluccas. Purchased of Mr. Frank.
c, *d*. Adult and half-grown. Ceylon. From the Collection of Messrs. von Schlagintweit.

2. Gazza equulæformis.

Rüppell, N. W. Fische, p. 4. tab. 1. f. 3; *Bleeker, Sumatra*, ii. p. 261; *Cantor, Catal.* p. 153.

B. 5. D. $\frac{8}{16}$. A. $\frac{3}{14}$.

The height of the body is $2\frac{1}{2}$–$2\frac{2}{3}$ in the total length, the length of the head $3\frac{3}{4}$ to 4 times. Canine teeth large. The second spine of the dorsal is one-half the height of the body; the second of the anal is stronger, and one-third of that height. Axil brown.

Red Sea; East Indian Seas.

a–c. Half-grown. From the Collection of the Zoological Society.
d–f. Half-grown: skins. Malayan Peninsula. From Dr. Cantor's Collection.

3. Gazza argentaria.

Zeus argentarius, (*Forst.*) *Bl. Schn.* p. 96; *Forst. Descript. Anim. cur. Lichtenst.* p. 288.

Gazza tapeinosoma, *Bleeker, Sumatra*, ii. p. 260.

B. 5. D. $\frac{8}{16}$. A. $\frac{3}{14}$.

The height of the body is one-third of the total length, the length of the head one-fourth. Canine teeth of moderate size. The second dorsal spine is slender, and one-half the height of the body; the second of the anal is stronger, and its height is $2\frac{1}{2}$–$2\frac{2}{3}$ in that of the body.

Seas of Sumatra and Tanna.

a. Adult. Tanna. Cook's Voyage.—Type of the species; afterwards called *Sparus scombroides*.
b. Adult. Tanna. Cook's Voyage.—Type of the species; afterwards called *Chromis scombroides*.

25. LACTARIUS.

Lactarius, *Cuv. & Val.* ix. p. 237.

Body oblong, compressed, covered with cycloid scales of moderate size; cleft of the mouth wide, oblique, with the lower jaw prominent. Teeth in the jaws small, *with one or two pairs of strong canines*; teeth on the vomer and the palatine bones. Præopercular margin entire. The first dorsal with seven or eight feeble spines, continuous; the second and the anal are more developed, scaly, without detached finlets. Three anal spines, continuous with the fin. Lateral line not armed. Head with muciferous cavities. Branchiostegals seven; air-bladder bifurcate anteriorly and posteriorly, the posterior branches being united together behind the hæmal spine. Pyloric appendages in small number.

East Indian Seas.

This genus approaches the family of *Sciænidæ*, and especially the genus *Otolithus*, by several characters, namely, by the structure of the mouth and of the air-bladder, by the muciferous cavities of the skull, and by the anal spines, which are continuous with the soft fin.

We have referred the genus *Scombrops* to the family of *Percidæ* (vol. i. p. 249); but if its affinities should be considered to be nearer to the *Scombridæ*, it would be best placed beside *Lactarius*.

1. Lactarius delicatulus.

Scomber lactarius, *Bl. Schn.* p. 31.
Russell, pl. 108.
Seriola lactaria, *Cuv. Regne Anim.*
Lactarius delicatulus, *Cuv. & Val.* ix. p. 238. pl. 261; *Richards. Ichth. China*, p. 272; *Cantor, Catal.* p. 138; *Bleek. Verh. Bat. Genootsch.* xxiv. *Makr.* p. 74.

B. 7. D. 7–8 | $\frac{1}{21-22}$. A. $\frac{3}{25-26}$. L. lat. 74. Cæc. pylor. 6.
Vert. 10/14.

The cleft of the mouth is very oblique and the lower jaw very prominent. Præorbital much narrower than the maxillary. The interocular space is convex, and equal in width to the orbit. Coloration uniform; sometimes with a black opercular spot.

East Indian Seas.

a. Half-grown. Madras. Presented by T. C. Jerdon, Esq.
b. Half-grown: skin: bad state. Malayan Peninsula. From Dr. Cantor's Collection.
c. Half-grown: bad state. Sumatra.
d. Adult. Amboyna. Purchased of Mr. Frank.
e. Half-grown. From the Collection of the Zoological Society.

Second Group. KURTINA.

One dorsal fin only, much shorter than the anal.

26. PEMPHERIS.

Pempheris, *Cuv. & Val.* vii. p. 296.

Body compressed, oblong; eye large; cleft of the mouth oblique, with the lower jaw prominent; snout very short. One short dorsal with the formula 6 9, not scaly. Anal elongate, scaly, with three spines. Scales of moderate size, or rather small. Villiform teeth in the jaws, on the vomer and the palatine bones. Seven branchiostegals; air-bladder divided into an anterior and posterior portion. Pyloric appendages in moderate number.

Indian Ocean and Archipelago; tropical parts of the Pacific.

1. Pempheris compressus.

Sparus compressus, *White, Journ. Voy. N. S. Wales, App.* p. 267. pl. f. 2.

D. $\frac{6}{10}$. A. $\frac{3}{36}$. L. lat. 68.

The height of the body is one-third of the total length; caudalis emarginate. Coloration uniform.

Australian Seas.

a. Adult: skin. Swan River. Voyage of H.M.S. Fly.
b, c. Adult and half-grown: skins. Port Jackson. Purchased of J. Gould, Esq.
d. Half-grown: skin. Australia. Purchased of Mr. Warwick.
e–h. Adult and half-grown: bad state. From the Haslar Collection.

2. Pempheris otaitensis.

? Pempheris oualensis, *Cuv. & Val.* vii. p. 299; *Less. Voy. Coq. Zool. Poiss.* p. 168; *Bleeker, Banda*, i. p. 242.
Pempheris otaitensis, *Cuv. & Val.* vii. p. 304. pl. 191; *Less. l. c.* p. 167.

D. 6/9. A. $\frac{3}{40-42}$. L. lat. 55–65. Cæc. pylor. 6–7. Vert. 10/14.

The height of the body is one-third of the total length; caudal emarginate. Reddish-brown: the dorsal anteriorly blackish-brown; axil and base of the pectorals black; the anal inferiorly, the caudal superiorly and inferiorly edged with brown.

East Indian Archipelago and Polynesia.

a. Adult. (China?) Presented by Sir J. Richardson.
b. Half-grown. Amboyna. Purchased of Mr. Frank.
c. Half-grown. Amboyna. Purchased of Mr. Frank.
d. Adult. From the Haslar Collection.
e. Half-grown: skeleton: bad state. Amboyna. Purchased of Mr. Frank as *Pempheris molucca*.

The *skeleton* is distinguished by a high but feeble occipital crest, and by the very dilated radius and ulna. There are ten abdominal and fourteen caudal vertebræ, the length of the former portion of the vertebral column being to that of the latter as 1:2·5. The abdominal vertebræ are very short, whilst those of the caudal portion gradually become longer posteriorly.

3. Pempheris mangula.

Mangula kutti, *Russell*, ii. pl. 114.
Pempheris mangula, *Cuv. & Val.* vii. p. 304; *Bleek. Verhand. Batav. Genootsch.* xxiii. *Chætod.* p. 30.
—— vanicolensis, *Cuv. & Val.* vii. p. 305.
—— nesogallica, *Cuv. & Val.* vii. p. 306.

D. $\frac{6-5}{9-10}$. A. $\frac{3}{38-40}$. L. lat. 45.

The height of the body is one-third of the total length; caudal emarginate. Violet-brown, minutely dotted with brown; the dorsal anteriorly black, the anal and caudal black-edged; pectoral without a black spot at the base.

Indian Ocean and Archipelago; Sea of Vanicolo.

4. Pempheris molucca.

Renard, i. 15. 85; *Valent.* iii. p. 360. f. 46.
Curtus macrolepidotus, *Bl. Schn.* p. 164.
Pempheris molucca, *Cuv. & Val.* vii. p. 306; *Faun. Japon. Poiss.* p. 85. pl. 44. f. 3; *Richards. Ichth. China*, p. 244; *Cantor, Catal.* p. 175; *Cuv. Règne Anim. Ill. Poiss.* pl. 44. f. 2.
—— malabarica, *Cuv. & Val.* vii. p. 308.

D. $\frac{6}{9}$. A. $\frac{3}{43-46}$. L. lat. 60.

The height of the body is one-third of the total length. Violet-brown above, silvery beneath; fins rose-coloured, sometimes brownish; axil and base of the pectoral whitish.

East Indian, Chinese, and Japanese Seas.

a, b. Adult. Madras. Presented by T. C. Jerdon, Esq.
c. Half-grown: skin. Malayan Peninsula. From Dr. Cantor's Collection.
d. Half-grown. Moluccas.

5. Pempheris schwenkii.

Bleeker, Batoe, p. 314.

D. $\frac{6}{9}$. A. $\frac{3}{36}$. L. lat. 35.

The height of the body is one-third of the total length; caudal scarcely emarginate. Brownish: the dorsal with the top black, caudal with brownish margins; the anal with a black band along all the base. (*Bl.*)

Sea of Batu.

6. Pempheris mexicana.

Cuv. & Val. vii. p. 308.

D. $\frac{6}{9}$. A. $\frac{3}{35}$. L. lat. 32. L. transv. 16.

Reddish-brown, with yellowish fins. (*Cuv.*)

Sea of Acapulco.

27. KURTUS.

Kurtus, *Bloch, Ausl. Fische,* ii. p. 121; *Cuv. & Val.* ix. p. 419.

Body compressed, oblong, covered with exceedingly small scales; cleft of the mouth wide, oblique, with the lower jaw prominent. Præoperculum denticulated. A single dorsal, much shorter than the anal, and with the spines rudimentary; anal with two spines, joined to the soft portion; ventrals well developed, between them a horizontal, backwards-directed spine. Villiform teeth in the jaws, on the vomer and the palatine bones. Branchiostegals seven; pseudobranchiæ none; air-bladder present, enclosed by the ribs, which are dilated, convex, forming rings with each other.

East Indian Seas.

1. Kurtus indicus.

Kurtus indicus, *Bl.* tab. 169; *L. Gm.* p. 1184; *Shaw, Zool.* iv. p. 185. pl. 25; *Bl. Schn.* p. 163; *Bleeker, Verhand. Batav. Genootsch.* xxiv. *Makr.* p. 78.
—— blochii, *Lacép.* ii. pp. 516, 517; *Cuv. & Val.* ix. p. 421. pl. 277; *Cuv. Règne Anim. Ill. Poiss.* pl. 64. f. 2.
Russell, p. 37. pl. 48.
Kurtus cornutus, *Cuv. & Val.* ix. p. 426. pl. 277; *Cuv. Règne Anim. Ill. Poiss.* pl. 64. f. 1.
Cyrtus indicus, *Cantor, Catal.* p. 145.

B. 7. D. $\frac{6-7}{13}$. A. $\frac{2}{31-33}$. Vert. 8/15.

The height of the body is $3\frac{1}{4}$ in the total length; præoperculum with three or four spines at the angle. The lateral line terminates below the dorsal spines; male with a cartilaginous appendix before the dorsal fin. Silvery; a black spot near the dorsal appendix.

East Indian Seas.

a. Adult. Pinang. From Dr. Cantor's Collection.
b, c. Adult: skins. Malayan Peninsula. From Dr. Cantor's Collection.
d, e. Half-grown. India. Presented by G. R. Waterhouse, Esq.
f. Half-grown. China. From Dr. Cantor's Collection.

Fam. 18. XIPHIIDÆ.

Sword-fishes.
Scomberoidei, pt., *Cuvier, Müller, Owen, Richardson.*
Xiphioidei, *Agass. Recherches Poiss. Foss.* v. p. 89.

Body elongate, compressed, naked, or covered with rudimentary dermal productions. Teeth none, or rudimentary. The upper jaw (ethmoid, vomer, and intermaxillaries) much produced, sword-shaped. One or two dorsal fins, without a distinctly spinous portion. Ventrals absent, or rudimentary and thoracic. Seven branchiostegals; pseudobranchiæ and air-bladder present. Pyloric appendages in great number. Vertebræ $\frac{12-14}{12}$.

Mediterranean; open seas between or near the tropics.

Synopsis of the Genera.

Ventral fins none..	1. XIPHIAS
Ventral fins present........	2. HISTIOPHORUS

1. XIPHIAS.

Xiphias, *Artedi, Genera,* p. 29.
Xiphias and Machæra, *Cuvier.*

Body rather compressed and elongate; the upper jaw much produced, sword-shaped, extending far over the lower jaw. Two dorsals (one in young specimens); no spurious fins; no ventrals; anal spines not developed. Scales none, or rudimentary; skin of immature specimens with rough granulations. Teeth neither in the jaws nor on the palate. Seven branchiostegals; air-bladder present. Pyloric appendages exceedingly numerous.

Mediterranean; Atlantic.

1. Xiphias gladius.

The Sword-fish.
Ξιφίας, *Aristot.* ii. c. 13. 15, viii. c. 19; *Athen.* vii. 314; *Ælian.* ix. c. 40, xiv. c. 23; *Oppian.* i. 8, ii. 48.
Xiphias, *Ovid. Hal.* v. 67; *Plin.* xxxii. c. 2. 11; *Rondel.* viii. c. 15. p. 251; *Bellon.* p. 109; *Gesner,* p. 1049; *Willughby,* p. 161. tab. L. 27. f. 2; *Ray,* p. 52; *Artedi, Genera,* p. 30.
Gladius, *Plin.* ix. c. 15; *Salv.* f. 126, 127; *Aldrov.* iii. c. 21. p. 332; *Gesner,* p. 379; *Schonev.* p. 35; *Olearius, Gottorff. Kunst-Kammer,* pp. 2, 37. tab. 23. f. 3 (faulty).
Xiphias gladius, *L. Syst.* i. p. 432; *Bl.* taf. 76; *Bl. Schn.* p. 93; *Fleming, Brit. Anim.* p. 220; *Risso, Ichthyol. Nice,* p. 99, and *Eur. Mérid.* iii. p. 208; *Cuv. & Val.* viii. p. 255. pl. 225, 226; *Storer,*

Report, p. 51; *Yarrell, Brit. Fishes*, i. p. 164; *Parn. Fishes Frith of Forth*, p. 55; *Cuv. Règne Anim. Ill. Poiss.* pl. 50. f. 1, pl. 51. f. 2, pl. 53. f. 2; *Demid. Voy. Russ. Mérid.* iii. p. 393; *Guichen. Explor. Algér. Poiss.* p. 60; *Dekay, New York Fauna, Fishes*, p. 111; *Lowe, Trans. Zool. Soc.* iii. p. 5.

Cetti, Hist. Sard. iii. pp. 93, 94, 145; *Duham.* ix. p. 334; *Hannæus in Ephem. Nat. Cur.* dec. ii. ann. 7. obs. 107, and *Hartm. ibid.* dec. iii. ann. 2.

Sicilian Sword-fish, *Penn. Brit. Zool.* iii. p. 216. pl. 30; *Knox in Edinb. Journ. Nat. & Geol. Sc.* ii. p. 427.

Xiphias rondeletii, *Leach in Wern. Mem.* ii. 58. pl. 2. f. 1, and *Zool. Misc.* i. p. 62. pl. 27.

Skeleton: *Rosenth. Ichthyot. Taf.* t. 21; *Cuv. & Val.* ix. pl. 231.

D. $\frac{3}{40}$. A. 17. Vert. 14/12.

The sword-shaped upper jaw much depressed and flat. Dorsal fin elevated in immature specimens; in old specimens the middle part of the dorsal and anal fins becomes very low or disappears, so that there are two fins on the back and behind the vent.

European Seas; Western and Northern coasts of Africa; found also on the other side of the Atlantic.

a. Seven feet long: stuffed. Margate.
b. Half-grown: stuffed.
c. Upper jaw of a large specimen.
d. Six inches long: not good state. Caught in Long. W. 22°, Lat. N. 2°. Presented by J. B. Jukes, Esq.

2. Xiphias velifer.

? Makaira nigricans, *Lacép.* iv. pp. 688, 689. pl. 13. f. 3; *Cuv. & Val.* viii. p. 287.

? Xiphias makaira, *Shaw, Zool.* iv. p. 104.

Histiophorus gracilirostris, *Cuv. & Val.* viii. p. 308.

Machæra velifera, *Cuv. Nouv. Ann. Mus. Hist. Nat.* 1832, p. 43. pl. 3; *Cuv. Règne Anim. Ill. Poiss.* pl. 52. f. 1.

D. 45 | 7. A. 12 | 7.

The dorsal is much higher than the body. The produced part of the upper jaw is slender, rather depressed. Dermal productions lanceolate. Dorsal with series of round black spots between the spines.

Atlantic.

2. HISTIOPHORUS*.

Istiophorus, *Lacép.* iii. p. 374.
Notistium, *Herm. Observ. Zool.* p. 305.
Tetrapturus, (*Rafinesque*) *Cuv. & Val.* viii. p. 280.
Histiophorus, *Cuv. & Val.* viii. p. 291.

Body rather compressed and elongate; the upper jaw much produced, conical, extending far over the lower. Two dorsals and two anals, the anterior of which are much longer than the posterior, and formed by spinous and soft rays; no spurious fins. Ventrals reduced to a single or to two or three spines. Scales none; sometimes rudimentary dermal productions. Small teeth in the jaws and on the palatine bones; none on the vomer. Seven branchiostegals; air-bladder present. Pyloric appendages exceedingly numerous.

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* 1. Histiophorus ancipitirostris, *Cuv. & Val.* viii. p. 309.
2. Tetrapturus georgii, *Lowe, Proc. Zool. Soc.* 1840, p. 36, and *Trans. Zool. Soc.* iii. 1849.—Madeira.

Seas between the tropics; one species from the Mediterranean.

1. Histiophorus belone.

Tetrapturus belone, (*Rafinesque*) *Cuv. & Val.* viii. p. 280. pl. 227; *Cuv. Règne Anim. Ill. Poiss.* pl. 51. f. 1; *Owen, Osteol. Catal.* p. 62; *Agass. Recherches Poiss. Foss.* v. p. 89. tab. E. (skeleton).

D. 43 | 6. A. 15 | 7. V. 1. Vert. $\frac{12}{12}$.

Dorsal fin not higher than the body. The height of the body is one-half the length of the head, and one-eighth of the total. The upper jaw is styliform, rounded above and rather flattened beneath; its length, from the nostrils, is one-half the length of the head. Coloration uniform.

Mediterranean.

2. Histiophorus herschelii.

? Tetrapturus indicus, *Cuv. & Val.* viii. p. 286.
Tetrapturus herschelii, *Gray, Ann. Nat. Hist.* i. p. 313. pl. 10.

D. 42 | 7. A. 12 | 6. V. 1.

The greater portion of the dorsal fin much lower than the body. The height of the body is more than one-half the length of the head, and one-seventh of the total. The upper jaw is rather depressed, rounded superiorly and inferiorly; its length, from the nostrils, is nearly three-quarters the length of the head. Dermal productions numerous, bifurcate, hidden in the skin.

Table Bay.

a. Eleven feet long: stuffed. Table Bay. Purchased of Mr. Smuts. —Type of the species.
b. Head, 37 inches long.
c. Anterior portion of the skull of a specimen of the same size.

3. Histiophorus gladius.

Nieuhoff, Embassy to China, p. 237; *Marcgr.* p. 171; *Willughby, App.* pl. 5. f. 9: *Valent.* iii. p. 509. f. 125; *Renard,* i. t. 34. f. 182, ii. t. 54. f. 233.
Scomber gladius, *Brouss. Mém. Acad. Sc.* 1786, p. 454. pl. 10; *Bl.* taf. 345 (bad).
Xiphias velifer, *Bl. Schn.* p. 93.
Istiophorus gladius, *Lacép.* iii. pp. 374, 375.
Xiphias ensis, *Lacép.* ii. p. 296.
Notistium, *Hermann, Observ. Zool.* p. 305.

Xiphias platypterus, *Shaw, Zool.* iv. p. 101.
Histiophorus indicus, *Cuv. & Val.* viii. p. 293. pl. 229; *Cuv. Règne Anim. Ill. Poiss.* pl. 53. f. 1.
—— americanus, *Cuv. & Val.* viii. p. 303; *Guichen. Poiss. in Ramon de la Sagra, Hist. Cuba,* p. 105.

D. 42–50 | 7. A. 10 | 7. V. 2. Vert. 14/10.

The upper profile of the head descending in a straight line. Dorsal fin much higher than the body. The height of the body is one-seventh or one-eighth of the total length, the length of the head one-fourth. The produced part of the upper jaw is conical, and longer than the remainder of the head. Dermal productions lanceolate. The membrane of the dorsal fin with numerous small spots.

Seas between, or near, the tropics.

a. Eight feet long: stuffed. Indian Ocean.—Type of the species.
b. Seven feet long: stuffed. Cape of Good Hope.
c. Dorsal fin. N. S. Wales (?). Presented by Dr. G. Bennett.
d. Snout: dried.

4. Histiophorus orientalis.

Temm. & Schleg. Faun. Japon. Poiss. p. 103. pl. 55.

D. 44 | 6. A. 10 | 6. V. 1.

The upper profile of the head and of the neck strongly curved. Dorsal fin much higher than the body, the membrane spotted with bluish. (*Schleg.*)

Sea of Japan.

5. Histiophorus immaculatus.

Rüppell, Proc. Zool. Soc. iii. p. 116, and *Trans. Zool. Soc.* ii. p. 71. pl. 15, and *N. W. Fische,* p. 42. taf. 11. f. 3.

D. 47 | 7. A. 10 | 7. V. 3.

The dorsal fin is much higher than the body. The height of the body is one-tenth of the total length, the length of the head about one-third. Dermal productions lanceolate. Coloration uniform; dorsal blackish, immaculate. (*Rüpp.*)

Red Sea.

6. Histiophorus pulchellus.

Cuv. & Val. viii. p. 305. pl. 230.

D. 48 | 8. A. 20 | 8*. V. 2.

The dorsal fin is much higher than the body. Præoperculum with a triangular spine at the angle. Head as long as the body, without caudal fin; the sword-shaped jaw slightly compressed. Dorsal fin with large irregular black spots.

Cap en France. (*Cuv.*)

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* Is not this a misprint for A. 10 | 8?

ADDENDA.

Page 11. **Chætodon modestus.**

$D. \frac{11}{21-23}. \quad A. \frac{3}{16-18}.$

The black spot on the dorsal fin is white-edged, and the cross-bands appear to be yellow rather than brown.

i, *k*. Adult and half-grown. Amoy (China). Purchased.

Page 18. **Chætodon octofasciatus.**

d. Fine specimen. Amboyna. Purchased of Mr. Frank.

Page 22. **Chætodon prætextatus.**

a–d. Adult: skins. Sea of Pinang. From the Collection of the East India Company.—Types of the species.

Page 23. **Chætodon vittatus.**

Add to the synonymy:—

Chætodon vittatus, *Beechey, Voy. Zool.* p. 61. pl. 17. f. 3.

Page 27. **Chætodon punctato-fasciatus.**

I consider three specimens from the New Hebrides as a variety of this species; some only of the scales of the sides are provided with a dark central spot; the spots are rather arranged in bands, five in number, obliquely descending from the soft dorsal towards the belly; the interspaces between these bands are nearly immaculate.

a–c. Stuffed. Aneiteum. From Mr. Macgillivray's Collection.

Page 29. **Chætodon aureus.**

Described by *Bleeker, Act. Soc. Sc. Indo-Nederl.* iii. *Japan*, p. 15.

Page 30. **Chætodon xanthurus.**

c. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

Page 34. **Chætodon oligacanthus.**

This species has been already described as *Platax ocellatus*, Cuv. & Val. vii. p. 229, and Cant. Catal. p. 170. The name given by Dr. Bleeker, however, may be preserved, as that of *Ch. ocellatus* has been applied to two or three different species. The numbers vary somewhat:—D. $\frac{6-7}{29-30}$. A. $\frac{3}{19-20}$. The posterior part of the ventrals is deep black. The four anterior bands are reddish, with black margins.

g–m. Adult and half-grown: skins. Malayan Peninsula. From Dr. Cantor's Collection.

Page 39.

5. **Chelmo truncatus.**

Chætodon truncatus, *Kner in Sitzungsberichte der Acad. Wiss. Wien*, xxxiv. p. 442. taf. 2.

D. $\frac{11}{26}$. A. $\frac{3}{21}$. L. lat. 43–44.

The length of the snout is not quite one-half that of the head; dorsal and anal fins angular, truncated posteriorly. Silvery, with five black transverse bands, between which are others of a greyish colour. (*Kner.*)

Sydney.

Page 40. **Heniochus macrolepidotus.**

r–w. Adult, half-grown, and young: skins. Malayan Peninsula. From Dr. Cantor's Collection.

x. Half-grown: not good state: stuffed. From the Collection of the East India Company.

y. Half-grown. Sea of Pinang. From Dr. Cantor's Collection.

Page 43. **Holacanthus annularis.**

b′. Adult: stuffed. Malayan Peninsula. From Dr. Cantor's Collection.

Page 46. **Holacanthus leucopleura.**

c, d. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

Page 46. **Holacanthus ciliaris**, and Page 47. **Holacanthus lepidolepis,**

which have been placed by mistake under the species in which the *body is ornamented by several cross-bands*, ought to be transferred to those which have *the body uniform or bicoloured, or merely spotted*, p. 49.

Page 48. **Holacanthus bispinosus.**

a, b. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

c. Adult. Amboyna. Purchased of Mr. Frank

Page 50. **Holacanthus bicolor.**

b, c. Fine specimens. Amboyna. Purchased of Mr. Frank.

Page 51. Add a new species:—

23 *a*. **Holacanthus cyanotis.**

? Holacanthus luteolus, (*Parkins.*) *Cuv. & Val.* vii. p. 198 (see p. 42).

D. $\frac{14}{16}$. A. $\frac{3}{17}$. L. lat. 46. L. transv. 6/23.

The præopercular spine is smooth, and reaches to the base of the pectoral; the dorsal and anal fins are subangular posteriorly. Yellow: the vertical fins and the orbit with a very fine blue edge; operculum with a blue vertical band posteriorly.

a. Stuffed. Aneiteum (New Hebrides). From Mr. Macgillivray's Collection.

Description of the specimen.—The form of the body is ovate, its greatest depth (behind the base of the pectoral) being two and two-fifth times in the total length. The head is small, nearly as high as long, its length being contained four times and one-third in the total. The interorbital space is flat, and its width is somewhat more than the diameter of the eye. Snout short, obtuse, rather longer than the eye. Præorbital denticulated. The præopercular spine is smooth, slightly compressed and curved, reaching to the base of the pectoral; both limbs of the præoperculum are provided with coarse denticulations. The dorsal fin commences above the opercle, and has rather slender spines; it is nearly entirely scaly, like the other vertical fins; the soft dorsal and anal are subangular posteriorly and of moderate height. Caudal rounded. Anal spines rather stronger than those of the dorsal fin; the third is the longest. The scales are not intermixed with small ones. Colour as stated above; it has very little changed, as appears from a note, taken by the collector from the living fish. Its native names are said to be "Jhia" and "Gopōch-gōpoch."

	lines.
Total length	48
Height of the body	20
Length of the head	11

Page 56. **Pomacanthus paru.**

There is a figure of the skeleton in Agass. Rech. Poiss. Foss. iv. p. 240. tab. G. (*Pomacanthus arcuatus*).

l. Skin. From the Collection of the Zoological Society (*P. balteatus*).

a. Very young specimen. Island of Cardova. Presented by J. U. Skinner, Esq.—This specimen belongs to the variety *P. arcuatus*; the yellow bands, however, terminate in blue, and there is always another bluish band between two yellow ones.

Page 58. **Scatophagus argus.**

Several of the specimens exhibit the fourth dorsal spine so short, that its length is one-third of the height of the body, and I begin to doubt whether *Sc. ornatus* is really a distinct species.

ε. Adult: stuffed. Calcutta. From the Collection of the East India Company.
ζ. Young. Calcutta. From the Collection of Messrs. von Schlagintweit.
η. Young. Bengal. From the Collection of the East India Company.
θ, ι. Young. Amoy (China). Purchased.
κ. Young. From the Collection of the East India Company.
λ–ξ. Half-grown and young: skins. From the Collection of the East India Company.

There is a figure of the skeleton in Agass. Rech. Poiss. Foss. iv. p. 230. tab. H.

Page 62. **Ephippus orbis.**

c. Adult. Sea of Pinang. From Dr. Cantor's Collection.
d–f. Half-grown and young: skins. Sea of Pinang. From Dr. Cantor's Collection.

Page 62. **Drepane punctata.**

This species has been figured by Dampier, Voy. New Holland, ii. pl. 4.

A. Uniform specimens.

l. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
m. Half-grown: skin. Presented by B. H. Hodgson, Esq.
n–q. Young. From the Haslar Collection.

B. With vertical series of brown specks.

r. Seventeen inches long: skin. East Indies. From the Collection of the East India Company.
s. Adult: skin. East Indies. From the Collection of the East India Company.
t. Adult: stuffed. From the Collection of the East India Company.
u, v. Half-grown. Singapore. From Dr. Cantor's Collection.

Page 64. **Scorpis æquipinnis.**

f, g. Half-grown. Australia. Presented by the Earl of Derby.—The pseudobranchiæ are present in the genus *Scorpis*; and this species has teeth on the pterygoid bones.

Page 65. **Atypus strigatus.**

f, g. Fine specimens. Erumanga. Purchased of Mr. Cuming.

Page 67. **Toxotes jaculator.**

i. Large specimen. Dukhun. From Colonel Sykes's Collection.
k. Adult: stuffed. Calcutta. From the Collection of the East India Company.
l–n. Adult and half-grown: skins. Malayan Peninsula. From Dr. Cantor's Collection.
o, p. Young. North Australian Expedition. Presented by Dr. J. R. Elsey.
q. Adult: skin. Purchased of J. Gould, Esq.

Page 72.

3 *a*. **Cirrhites rivulatus.**

Valenc. in Voy. Vénus, Poiss. p. 309. pl. 3. fig. 1.

D. $\frac{10}{11}$. A. $\frac{3}{6}$. L. lat. 45.

Seven simple pectoral rays. Greenish-olive, with lighter spots edged with blue; four brownish-olive, blue-edged bands on the side of the head, two on the base of the pectoral; caudal with reticulated blue lines. (*Val.*)

Galapagos Islands.

Page 83. **Chilodactylus zonatus.**

f. Fine specimen. Amoy (China).
g. Fine specimen. Amoy (China).

Page 85. **Chilodactylus gibbosus.**

f. Adult. Australia. Purchased of Mr. Cuming.

Page 97. **Sebastes pachycephalus.**

Add to the synonymy:—

Bleek. Act. Soc. Sc. Indo-Nederl. iii. p. 13. tab. 1. fig. 1.

Page 99. **Sebastes dactylopterus.**

d. Fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.
e. Fourteen inches long. Lanzarote. Presented by the Rev. R. T. Lowe.
f. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.
g. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.
h. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.
i. Adult. Madeira. Presented by the Rev. R. T. Lowe.
k. Half-grown. Madeira. Presented by the Rev. R. T. Lowe.

The length of the third dorsal spine is one-half or two-fifths of that of the head.

Page 103. **Sebastes kuhlii.**

f–h. Fine specimens. Madeira. Presented by the Rev. R. T. Lowe.

Page 105. **Sebastes marmoratus.**

Specimen *b.* is now formed into a skeleton.

d. Fine specimen. Amoy (China).
e. Fine specimen: half-grown. Amoy (China).

Page 109. **Scorpæna scrofa.**

γ. Adult. Lisbon. Presented by the Rev. R. T. Lowe.
δ. Twenty inches long. Lanzarote. Presented by the Rev. R. T. Lowe.—This specimen differs from the others in having the third dorsal spine elongate, much longer than the second and fourth, one-half the length of the head. In all the other specimens, except specimen *a*, that spine is shorter; and a portion of the diagnosis, therefore, must be altered: "the length of the third dorsal spine is one-third or one-half of that of the head." The soft dorsal fin is composed of nine or ten rays.
ϵ. Half-grown: skin. From Gronow's Collection.

Page 110. **Scorpæna ustulata.**

Add to the synonymy:—

Lowe, Trans. Zool. Soc. iii. p. 2.

Page 112. **Scorpæna cruenta.**

Add to the synonymy:—

Scorpæna militaris, *Richards. Trans. Zool. Soc.* iii. p. 90.

Page 115. **Scorpæna picta.**

d. Adult: skin. Sea of Pinang. From Dr. Cantor's Collection.

This specimen, although apparently otherwise not different from the others, presents a long filament above each eye, as has been observed by Dr. Cantor, Catal. p. 41.

Page 123. **Pterois volitans.**

u. Half-grown: skin. From Gronow's Collection.

Page 124. **Pterois kodipungi.**

Add to the synonymy:—

Pterois miles, *Cantor, Catal.* p. 42 (not synon.).

d–f. Adult and half-grown: skins. Sea of Pinang.—Types of Dr. Cantor's description.

Page 125. **Pterois miles.**

Pterois miles of Cantor is not synonymous with *Pt. miles* of Bennett, or *Pt. muricata* of Cuvier.

The species is distinguished by a broad band of erect spines along the infraorbital bones. The rays of the soft portions of the vertical fins are dotted with brown; a series of white dots along the lateral line. D. $12 \mid \frac{1}{11-12}$ The species is very well described by Cuvier.

a. Fifteen inches long: stuffed. Aneiteum (New Hebrides). From Mr. Macgillivray's Collection.

Page 128. **Centropogon australis.**

d. Fine half-grown specimen. Erumanga. Purchased of Mr. Cuming.

Page 136. **Tetraroge echinata.**

a. Type of the species. Sea of Pinang. From Dr. Cantor's Collection.

Page 139. **Prosopodasys trachinoides.**

c, *d*. Skins: Malayan Peninsula. From Dr. Cantor's Collection.
e. Adult. Pinang. From Dr. Cantor's Collection.

Page 145. **Synancidium horridum.**

o. Adult: skin. From the Collection of the East India Company D. $2 \mid \frac{10}{7}$.

Page 148. **Micropus unipinna.**

c, *d*. Feejee Islands. Voyage of the 'Herald.'—Ventrals scarcely perceptible.

Page 148. **Minous monodactylus.**

p, *q*. Adult and half-grown: skins. Malayan Peninsula. From Dr. Cantor's Collection.

Page 151. **Pelor japonicum.**

g. Half-grown: injured. Amoy (China).

Page 157. **Cottus gobio.**

v. Adult: skin. Cuneo. From Mr. Yarrell's Collection.

Page 159. **Cottus scorpius.**

Add to the synonymy:—

Marulke, *Stroem, Söndmör,* i. p. 296.

Page 161. **Cottus grœnlandicus.**

d'. Adult: stuffed. Montrose. Presented by W. Beattie, Esq.—(Cfr. Ann. & Mag. Nat. Hist. April 1860.)

On its occurrence on the Irish coast, see M'Coy, Ann. & Mag. Nat. Hist. 1841, vi. p. 403.

Page 167. Add a new species :—

21*a*. **Cottus criniger.**

D. 9/16. A. 14. V. 1/3.

Two spines above the snout. Crown of the head smooth, with many hair-like tentacles. Præoperculum with a short bifurcate spine posteriorly. Teeth on the vomer, none on the palatine bones. The lower margin of the præoperculum, the base of the dorsal fins, and the anterior half of the lateral line with many hair-like tentacles. Brownish, spotted with darker.

Coast of California.

a–c. Monterey.

Description.—The greatest height of the body, above the root of the pectoral fin, is contained four times and three-fourths in the total length, its greatest width above the pectoral six times. The tail is compressed, and its height before the caudal is one-thirteenth of the total length. The head resembles in form more that of a *Trigla* than of a *Cottus*; it is about as high as broad; its length is contained four times and a fourth in the total. The snout is high, somewhat short, with the upper profile straight, and abruptly descending. The upper jaw is a little longer than the lower; the cleft of the mouth is of moderate width, and the maxillary does not extend to the vertical from the centre of the eye; there is a pair of small spines above the snout. The eye is lateral, but situated immediately below the upper profile of the head; its diameter is contained three times and a half in the length of the head; the interorbital space is very slightly concave, and its width is much less than that of the eye. The crown of the head and the occiput are flat, without any protuberances, but with many short hair-like tentacles. The præoperculum is armed posteriorly with a short bifurcate spine; no other spines are visible. Branchiostegals six; gill-membrane continuous under the throat.

The first dorsal commences above the extremity of the operculum, is rather low, and not continuous with the soft; the length of its base equals its distance from the anterior margin of the orbit. The second dorsal fin is somewhat higher than the first. The caudal has the posterior margin convex, and its length is contained five times and a half in the total. The anal fin commences in the vertical from the fourth dorsal ray, and terminates before the soft dorsal fin; it is lower than the latter. The pectoral is composed of fifteen simple rays, and extends beyond the origin of the anal, which is somewhat nearer to the root of the caudal than to the extremity of the snout. The ventral reaches to the origin of the anal; its spine is enveloped in the same membrane with the first ray; the middle ray is somewhat the longest.

The lateral line is continued to the caudal, and composed of small tubes. A series of short hair-like tentacles occupies the anterior half, another series the bases of the dorsal fins. The skin of the other parts is perfectly smooth.

The ground-colour is yellowish-brown, with irregular dark-brown spots and dots; the lower side of the tail with white dots. The vertical fins and the pectorals with brown dots, arranged in series.

	lines.
Total length	38
Height of the body	8
Smallest height of the tail	3
Greatest width of the body	6¼
Length of the head	9
Diameter of the eye	2½
Length of the caudal fin	7
——— of the pectoral fin	10

Page 168. **Cottus tricuspis.**

Add to the synonymy :—

Phobetor tricuspis, *Gaimard, Voy. Scandin.* pl. 4. fig. 1.

Page 170. **Centridermichthys asper.**

a. Type of the species. Columbia River. From the Haslar Collection.

Page 171. **Centridermichthys parvus.**

This species is very closely allied to *C. asper.*

a. Adult. Fraser's River. Voyage of H.M.S. Plumper.—D. 8 | 21. A. 18.

Page 171. **Centridermichthys maculosus.**

i–t. Young. Vancouver Island. Voyage of H.M.S. Plumper.—Palatine teeth and tentacles scarcely perceptible.

Page 172. **Centridermichthys armatus.**

d. Fine specimen. Vancouver Island. Voyage of H.M.S. Plumper.—D. 8 | 19. A. 18.

Page 172. **Icelus hamatus.**

Figured by *Gaimard, Voy. Scandin.* pl. 1. f. 2.

Page 173. **Triglops pingelii.**

Figured by *Gaimard, Voy. Scandin.* pl. 1. f. 1.

Page 176. **Polycaulus elongatus.**

n. Fine specimen. Amoy (China).

Page 182. **Platycephalus japonicus.**

n–p. Young. China. Presented by Captain Sir E. Belcher, C.B.

Page 191. **Hoplichthys langsdorffii.**

Add to the synonymy:—

Bleek. Act. Soc. Sc. [illegible]*o-Nederl.* iii. *Japan*, p. 11.

s. Dried specimen. Japan.

Page 201. **Trigla lineata.**

r. Adult: not good state. Lanzarote. Presented by the Rev. R. T. Lowe.

Page 205. **Trigla polyommata.**

d. Adult. North Australia. Purchased of Dr. Bowerbank.—D. 8 | 11. A. 13.

Page 205. **Trigla gurnardus.**

The observations of Parnell on the identity of *T. gurnardus* and *T. cuculus* have been confirmed by Thompson, in Ann. & Mag. Nat. Hist. 1839, ii. p. 413.

Page 214. **Agonus spinosissimus.**

Figured by *Gaimard, Voy. Scandin.* pl. 5. f. 2.

Page 215. **Agonus decagonus.**

Figured by *Gaimard, Voy. Scandin.* pl. 5. f. 1.

Page 216. Add a new species:—

2. **Aspidophoroides inermis.**

D. 5. A. 5. C. 10. P. 10. V. 2. L. lat. 41.

No spines above the snout. Body moderately long. Black, obscurely marbled with brownish.

a. Fine specimen. Vancouver Island. Voyage of H.M.S. Plumper.

Description of the specimen.—The body is prismatic, octahedral before the dorsal fin, hexahedral behind it, a keel running along each series of shields. The anterior part of the body is much broader than high, and the back, between the head and the dorsal, is concave; its greatest depth, at the root of the pectoral, is one-fourteenth of the total length, its greatest width one-ninth, the length of the head one-fifth. The head is flat, depressed, triangular; the interorbital space grooved. and rather narrower than the orbit. The length of the eye is one-fifth of that of the head, and less than that of the snout. There are no spines above the snout; the lower jaw projects beyond the upper; the maxillary does not extend to the anterior margin of the orbit. The jaws, the vomer and the palatine bones are armed with minute teeth; there is a series of four pores along the infraorbital bones. The gill-membranes are continuous under the throat, and each of them has six branchiostegals.

The breast is shielded by about sixteen hexagonal plates; that which forms the base for the ventral fins is not much larger than the others. The pectorals are rounded, shorter than the head, and composed of ten simple rays; the ventrals are situated entirely at the lower part of the body, immediately behind the vertical from the root of the pectoral; they are small, and I cannot find a distinct spine. The dorsal fin is triangular, higher than the body, situated behind the middle of the total length; its origin corresponds to the twentieth scale of the lateral line. The caudal fin is rounded, of moderate length, composed of ten simple rays. The anal is similar to the dorsal in form, and its origin falls immediately before the vertical from the first dorsal ray.

The body and tail are shielded by as many series of plates as there are longitudinal ridges, namely, the former by eight, and the latter by six.

The vent is situated in the middle, between the ventral fins.

The ground-colour is black, obscurely marbled with greyish and brownish; dorsal fin greyish, marbled with black; pectoral and caudal black, with a greyish band across the middle; anal yellowish, with a black dot behind each ray.

	lines.
Total length	32½
Height of the body	2⅓
Greatest width of the body	3½
Length of the head	6⅓
——— of the eye	1¼
——— of the pectoral fin	4

Page 224. **Cephalacanthus spinarella.**

y. Half-grown. Presented by J. B. Godfrey, Esq.
z–*β*. Half-grown. Presented by J. B. Godfrey, Esq.

Page 239. **Percis cylindrica.**

h. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.—This specimen differs somewhat from those formerly described. It has fifty-eight transverse rows of scales, and the ventral fins reach only to the third anal ray.

Page 244. **Sillago sihama.**

q. Half-grown. Amoy (China).

Page 247. **Eleginus maclovinus.**

h. Fourteen inches long. Falkland Islands. Purchased of Mr. Jamrach.

Page 271. **Micropogon undulatus.**

Add to the synonymy:—

Bodianus costatus, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 417.
Micropogon costatus, *Dekay, New York Fauna, Fishes*, p. 83. pl. 72. f. 230 (cop. from *Cuv. & Val.*).

Page 281. **PACHYURUS.**

Not having access to a paper by Prof. Reinhardt, published in 'Videnskabelige Meddelelser fra den naturhistoriske Forening i Kjöbenhavn,' 1854, p. 108, I must content myself with quoting the abstract given by Prof. Troschel in Wiegm. Archiv, 1855, p. 437:—

"Reinhardt has proved the identity of *Lepipterus*, Cuv., with *Pachyurus*, Agass.; the latter name is the prior. His *Lepipterus corvina*, and a new species, *P. lundii*, from the Rio das Velhas, in Brazil, belong also to this genus. He considers Heckel's *Sciæna squamosissima* as the type of a separate genus, near *Pachyurus*."

The latter species, described by Heckel in 'Annalen des Wiener Museums,' ii. 1840, p. 438, has the following formula,—

$$\text{D. } 10 \left| \tfrac{2}{31}. \right. \quad \text{A. } \tfrac{2}{6}. \quad \text{L. lat. } 85\text{–}90,$$

and is said to be distinguished by some of the scales being covered with smaller scales. The caudal is densely scaly; but nothing is mentioned of the structure of the other fins.

Page 293. **Sciæna dussumieri.**

c. Half-grown. Amoy (China).
d. Young. Amoy (China).

Page 313. **Collichthys lucida.**

t. Adult. Amoy (China).
u, *v*. Young. Amoy (China).

Page 327. **Polynemus lineatus.**

This name is preoccupied by M'Clelland for a fish identical with *Polynemus indicus*, and must therefore be altered into that of *Polynemus tæniatus*.

Page 330. **Polynemus tetradactylus.**

r. Adult. Amoy (China)

Page 350. **Thyrsites atun.**

In the note on this species, I have omitted to quote "Trans. Zool. Soc. iii. p. 120," where Sir J. Richardson is fully aware of the differences which are to be observed in Australian specimens: he considers *Th. altivelis*, with seven finlets, as merely a variety of *Th. atun*. The number of the pyloric appendages is seven.

Page 359. **Scomber pneumatophorus.**

e. Half-grown. Madeira. Presented by the Rev. R. T. Lowe.

Page 364. **Thynnus pelamys.**

On its occurrence near Dublin, see M'Coy in Ann. & Mag. Nat. Hist. 1841, vi. p. 403.

Page 371. **Cybium guttatum.**

r. Half-grown. Amoy. Purchased.

Page 508. **PEMPHERIS.**

Add as a doubtful species:—

Pempheris schomburgkii, *Müll. & Trosch. in Schomb. Hist. Barb.* p. 669.

CATALOGUE

OF

FISHES.

Order I. ACANTHOPTERYGII.

(*CONTINUED.*)

Fam. 8. SQUAMIPINNES.

Squamipinnes, part., *Cuv. Règne Anim.*; *Müller, Berl. Abhandl.* 1844, p. 201; *Owen, Lect. on Comparat. Anat. Vert.* i. p. 49.
Chætodontidæ, part., *Richards. Ichthyol.*

Body compressed and *elevated*, covered with scales, which are sometimes exceedingly finely ciliated, and sometimes smooth. Lateral line continuous, not continued on the caudal fin. Mouth in front of the snout, generally small, with lateral cleft. Eye lateral, of moderate size. Six or seven branchiostegals. Dentition formed by villiform or setiform bands, without canines or incisors; some of the genera with teeth on the palate. *Dorsal fin formed by a spinous and soft portion of nearly equal development; anal with three or four spines, similarly developed as the soft dorsal, and both many-rayed. The vertical fins more or less densely covered with small scales*; the spinous portions sometimes not scaly. The lower rays of the pectorals branched; ventrals thoracic, with one spine and five soft rays. Stomach cæcal; pyloric appendages in moderate number; intestines generally with many convolutions. Air-bladder present, more or less simple. Pseudobranchiæ well developed.

Mostly carnivorous fishes, inhabiting the seas between the Tropics, especially of the Indian region; a few entering rivers or spreading beyond the Tropics.

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